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Cover: Kimberley freelance photographer Pat Morrow did a lot of recreational mountain climbing in the Kootenays before he became the second Canadian to scale Mt. Everest, which is how he came to be on Idaho peak in the Selkirks one sunny day when the wildflowers were in full bloom.

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Many B.C. communities could not exist without the forest industry, and over the past year these forestry-based communities have faced tough economic times because of declining world markets for lumber and pulp. But there's been a change in the wind. Last year the talk in the industry was about sawmills or pulp mills on the verge of closing; this year the rumours are about the mills opening again. And as we emerge from this recession, we'll be a leaner, more productive, more competitive forest industry than we've been for a long time.

Hon. Tom Waterland,
Minister of Forests

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THE VIEW BEYOND
THE VALHALLAS

They're creating a new park in the Valhallas, and that's just one of many long standing land-use issues in the West Kootenay on the road to being resolved.

by Douglas Cowell

Valhalla Mountain Touring guide Craig Pettitt stands high on a mountain ridge in the fast-fading light, waiting while his ski party pulls on extra sweaters and cinches up parkas for the run down to the cabin.

Pettitt was raised here, hunting and fishing with his father. At the age of 12 he began helping a local trapper, learning to be at home in the bush. He has worked as a logger, as assistant forest ranger, and as backcountry ranger with Provincial Parks. Now he guides ski-touring trips in winter and is fire suppression crew boss for the Ministry of Forests in summer. "And it seems being a director on the Valhalla Wilderness Society board has been a full time job these days."

The society has been dedicated to having a section of the Valhalla Mountain Range set aside as a provincial park, and is only one of the parties engaged in the controversial land-use debates that have been going on here for years.

"It's all laid out at my feet here," Pettitt muses. "Up here above the treeline the competition for resources isn't too bad. There are a few mining people who want to make sure they don't lose the right to put mines in, and there are us recreation types, and the wildlife. But down below, in the forests, that's where it's tough."

And indeed, in the West Kootenay, where the forest industry is the largest single employer, forest management is a major source of resource-use contention. Forest products companies need a constant supply of wood. The Ministry of Forest's responsibility is not only to provide good forest management, but also to insure that a healthy forest industry is maintained. Recreationists want wild lands protected. Conservationists demand that wilderness areas and the environment's ecological integrity be maintained. Tourism operators know their customers want pristine mountain scenery. Miners argue the importance of their industry and defend their access to mineral deposits. There's lots to fight about.

But this afternoon Pettitt is keeping away from all the issues. He's simply appreciating the beautiful land.

The vista Pettitt is meditating on is mainly Crown forestland and a part of that area designated by the Ministry of Forests as the Arrow Timber Supply Area (TSA). Beginning at the U.S. border, the TSA boundaries run north, approximately along the tops of the Selkirk and Monashee Ranges, narrowing into a strip of mountains east of Revelstoke. It includes the Arrow and Slocan Lake systems and such towns as Castlegar, Trail, New Denver and Nakusp. The area's forests are managed as a unit to provide a regular timber supply.

Slocan Forest Products is the major forestry operator in the Arrow TSA. ATCO, Louisiana Pacific, Kalesnikoff Lumber and several other operators also have cutting rights here, but the region's largest operator is B.C. Timber, formerly CanCel and Kootenay Forest Products. It operates partially within the Arrow TSA boundaries on Tree Farm License 23. TFL 23 is spread out along the Arrow Lake system, and its logs are floated to a sawmill and pulp mill at Castlegar.

This part of the world wasn't always primarily a wood producer. In the late 1800s it was opened up by a mining boom. Prospectors routinely burned off whole watersheds to make rock outcrops more visible and to make travel easier. Predictably, the boom fizzled out, leaving boom towns such as Silverton, New Denver and Sandon struggling. Some became ghost towns while others became the basis for a slowly diversifying economy: mixed farms and orchards, a little logging, some mining; it grew slowly. Lending stability to the region were the hard-working Doukhobors with their self-sustaining farming and logging economy.

In the 1950s and 1960s, development accelerated. The mill and smelter at Trail grew to be the largest such complex in the world. Sawmills, a pulp mill and a plywood plant sprang up. Roads snaked into the backcountry to provide access to wood to supply those mills. The forest industry became king. B.C. Hydro was busy too, building dams on the Arrow and Duncan Lakes. Some of the best forest and farming land in the interior was flooded.

(Previous page) ***Valhalla Mountain Touring guide Grant Copeland*** *(in suspenders)* ***pauses with his cross-country skiing party just outside the new Valhalla park boundary.*** *(Above)* ***A mountain climber's view of the Valhallas from atop Mt. Gimli.*** *(Opposite page)* ***A look at the Vallhallas across Slocan lake from the top of Idaho peak near New Denver.***

Kootenay Lake, east of the Slocan Valley, became a popular summer resort area. The population grew. The regional economy, although below the provincial average, seemed healthy enough as wood to feed the mills poured in.

By the early 1970s the development bubble was beginning to burst. More and more people were moving to this beautiful, mountainous area, looking for rural homesteads. Increasing ecological consciousness was placing more operational constraints on forest managers. Many of the newcomers came with educated, middle-class backgrounds, escaping what they perceived to be the excesses of the big cities. They came with different values, an ability to handle complicated issues, and a willingness to make their wishes known. Tensions were unavoidable.

Throughout the 1970s contentious issues such as the formation of parks, logging techniques, and uranium mining filled the "Letters to the Editor" pages of local newspapers. Although time and familiarity inevitably taught the various factions to get along together, the land-use conflicts only increased.

To cope with the situation in the Slocan Valley, The Slocan Valley Planning Program, a joint regional and provincial venture, was undertaken. Provincial government resource agencies, the public, industry and the regional district worked together on various resource and economic issues. The list goes on and on: annual timber cuts, environmental protection, recreation and tourism development, preservation of agricultural land, mining development, settlement patterns and watershed management.

Provincial ministries generated inventories and recommendations; local citizens' committees wrestled with the needs of residents and began realizing how difficult and complex the problems were. The reports piled up.

To insure public participation, public meetings were organized and input invited from any and everyone involved. But before any development plan could be put into effect, the region had to await a decision that only the Environment and Land-Use Committee (ELUC) of the provincial cabinet could make: whether or not to create a new provincial park in the Valhalla Mountains.

The park proposal to reserve a 60,000 hectare area of mountains along the west side of Slocan Lake originated in the early 1970s at a meeting of the Kootenay Mountaineering Club. Pettitt explains the reasoning behind it: "From highway six, along the east side of the lake, you've got this wilderness vista across the lake and the far shore, and then all the way up the mountains there's a succession of forest types. And you've got some great peaks up top.

"Slocan Lake is undammed and good for recreation. The west shore is good for camping and hiking, with beaches and waterfalls, and Indian rock paintings. There are some hiking trails up the mountains; if it were a park you'd have more. Up top there's great high-country hiking and mountaineering. Climbers love some of those rock faces."

On the other hand, the forest ministry's district manager Glen Allin notes that low-altitude forestland in the interior, such as much of the land in the Valhalla park area, is good wood-producing country. "Although it doesn't look like it now to an untrained eye, a lot of the forested park area was heavily logged years ago and is stagnant now. It's full of disease and needs to be logged and put back into production by planting a healthy forest there."

Slocan Forest Products' woodlands manager Terry Dods expresses a common concern of B.C.'s forest industry: "It's a straight fact that we're suffering a loss of our forestland base and it's causing a loss in production.

"The planning process has a lot to offer and we've been involved in the Slocan planning process from the start. But we had serious differences with the committee on economic issues. They spent endless time discussing a new tourism economy, but any time we tried to talk about forestry we ran into a stone wall."

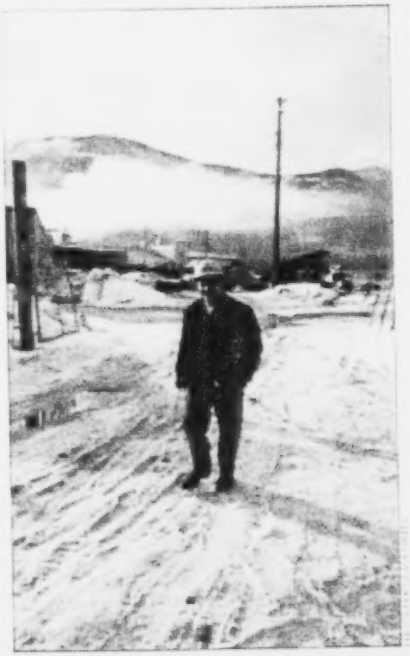
"We're not against logging," Pettitt counters. "But you know, it seems that almost every major watershed in both the East and West Kootenays that I hunted and fished in as a boy has either been flooded for hydro power or has clearcut logging or open pit mining on it.

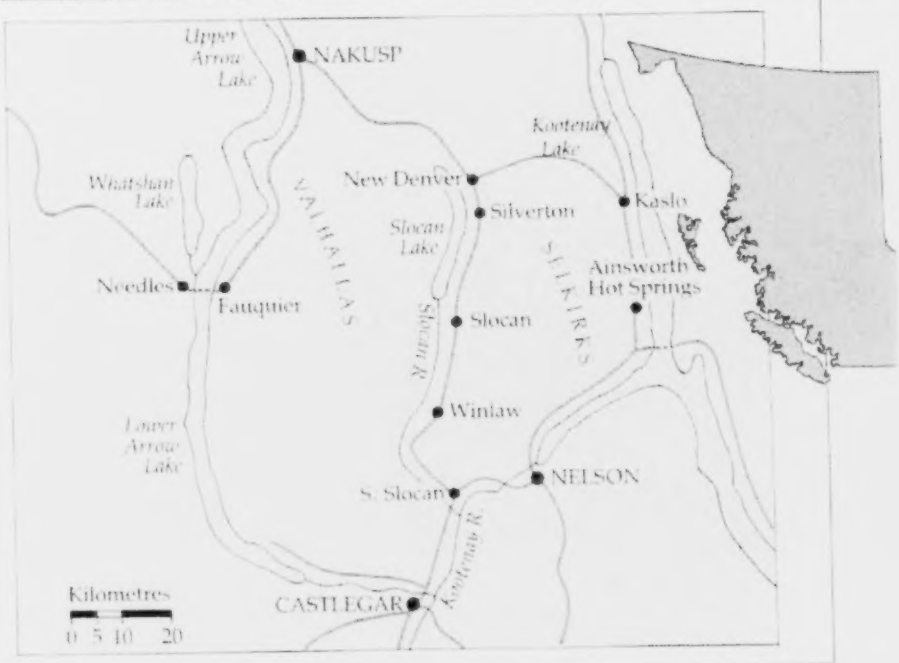
"We've got to diversify, and around here tourism is one good way to do it. But who'd want to come here if the hillsides were all hacked up with logging cuts?

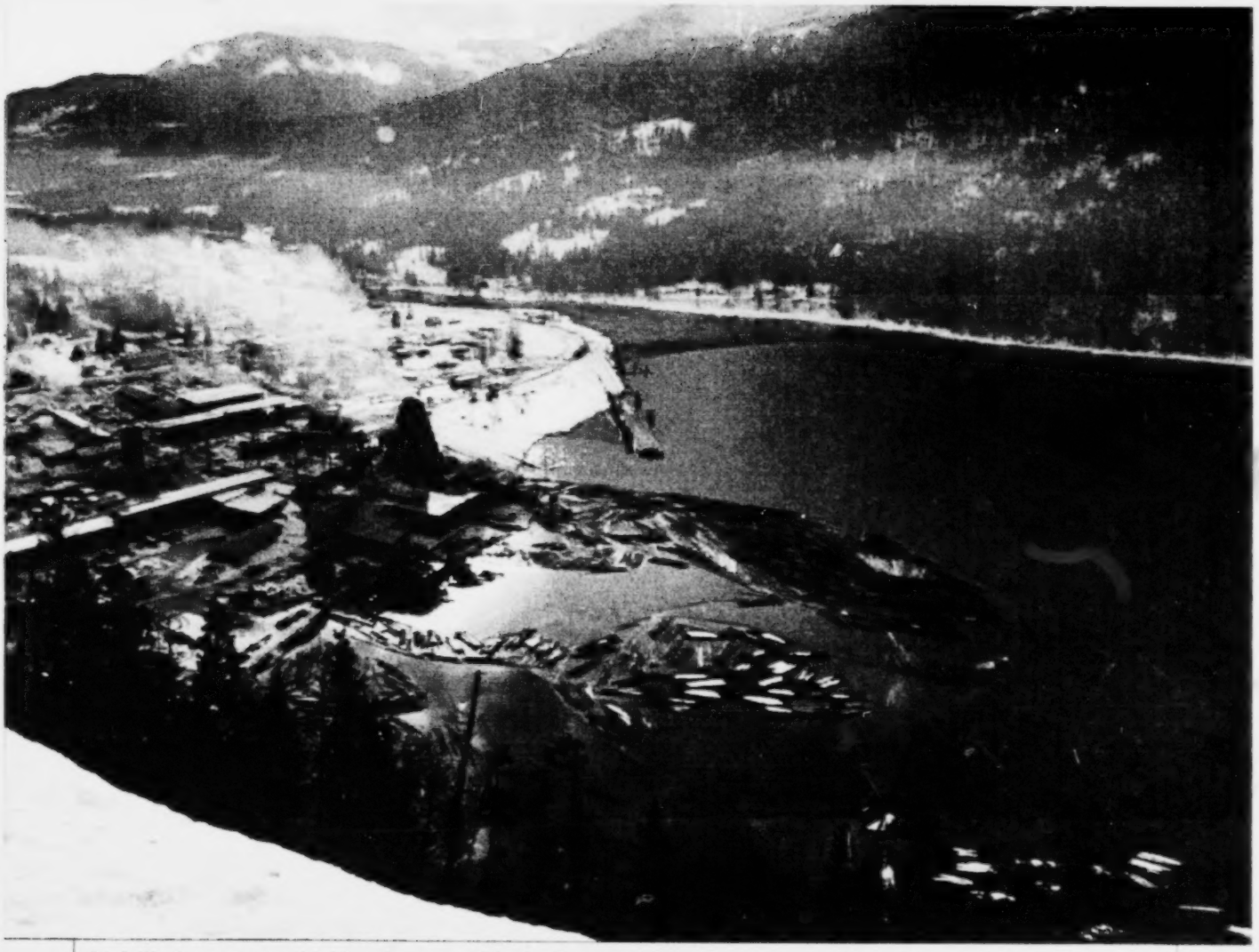
"Besides, we've got the figures on our side. We have a consultant's report saving that when we make the Valhallas a park and develop tourism in a big way, we'll have something like 15 or 20 times the number of jobs in the valley than we would if we had just decided to log that land."

Dods stresses the point that tourism is a future possibility. But logging, despite the currently depressed economy, is a proven source of revenue for the region. "I

The forest industry is the Kootenays' biggest single employer, and the debate over whether logging and recreation should co-exist in the Valhallas has been going on for over a decade. Sitting on the shores of Slocan Lake opposite the Valhallas is Slocan Forest Product's lumber mill (right), where one unidentified SFP worker (below) pauses for the camera during an afternoon shift change.







think it's time we start thinking about protecting what we already have. We've long advocated that the southern half of the proposed Valhalla park area be reserved — made into a park or whatever, but that the northern half be managed like the rest of the forests. Those people who want the whole area as a park and want increased tourism refer to their consultant's report that says that if $17 million were invested, in the future tourism would earn so much. We employ 250 to 300 people and have a lot more than $17 million invested."

Floyd Dykeman of the Central Kootenay Regional District points out that although the recommendations of the regional government were solidly "pro park" and in favour of tourism development, "The regional board wants economic diversity in the valley and so encourages logging and mining as well. It asked that the whole park proposal area be protected, but the northern section should remain within the Provincial Forest for integrated use."

Then, on February 16, 1983, ELUC made its announcement. Having carefully weighed all the arguments, it decided that the Valhallas should become a 60,000 hectare shoreline-to-mountain peak wilderness provincial park to be managed exclusively for its recreation and tourism values.

With that issue finally decided, land managers can give more attention to the other resource-use problems still plaguing the West Kootenay. Leading the list is the issue of logging in community watersheds. For years it was government policy to concentrate logging in areas away from settlements or major transportation corridors. Towards the end of the 1970s the supply of backcountry timber began to run out in parts of the Arrow TSA, and plans were made to harvest hillsides facing major valleys and in domestic watersheds.

Many Slocan Valley residents were outraged. They had moved there for the natural beauty. Clearcuts didn't fit the bill. Moreover, most residents wanted to live a rural life. That means that virtually every small creek is someone's domestic watershed, and many landowners feared that logging would foul their water supply.

Forest ministry district manager Glen Allin is aware of these concerns, but explains: "It only takes a five-dollar water license to tie up thousands of hectares of timber. A big problem for us is that there's no community development plan in the Slocan, no zoning. Almost every creek is licensed, but you just can't take that much forest out of production when the local economy depends on it so much. We've already lost so much of the land to settlement, roads and the flooding of valleys."

Adds Slocan Forest Products' Terry Dods: "I believe that, to one extent or another, every watershed can be log-

ged. Logging techniques have changed over the last 20 years — over the last five years — and they're still changing. It's time to get on with one of the management functions, namely harvesting."

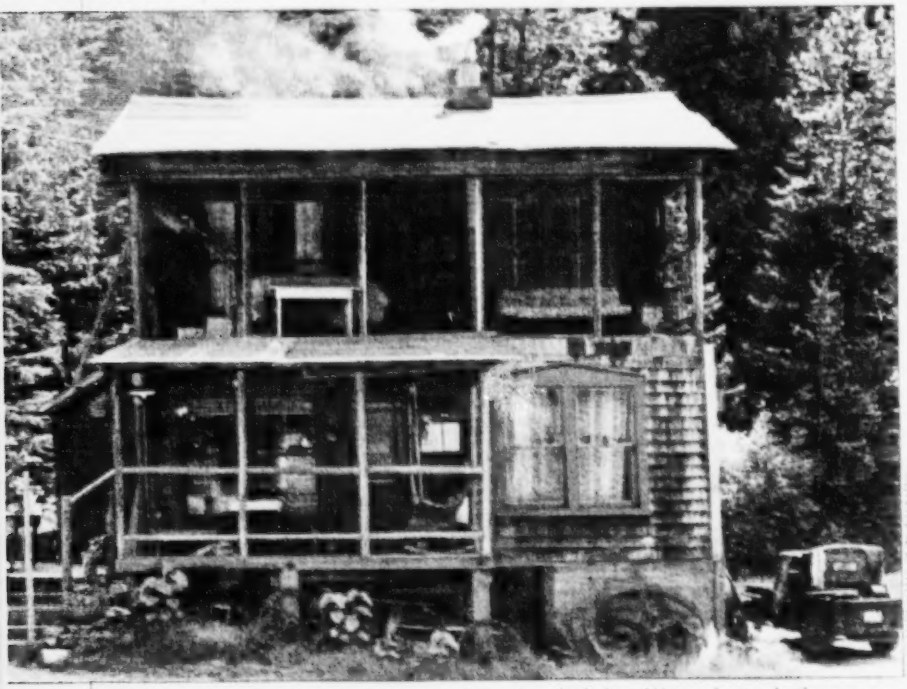
It seems there will always be another watershed issue to solve in the West Kootenay, but at least one method for coming to terms with the problem is in place. Over the years, ministry and local citizens have learned to put their heads together to work out solutions for specific watersheds, in the process preparing the ground for the ministry's province-wide public involvement program.

One of the fastest growing demands on the landbase in the Arrow TSA is for recreation. Doug Levers, who last winter was the forest ministry's recreation resource assistant for the area, found that his most enjoyable winter chore was to maintain and monitor the use of a system of cross-country ski trails in the Paulson Summit area near Rossland.

As he worked his way around the circuit on skis one cloudy winter day, clearing overhanging branches, checking the trail condition and talking to users, he explained something about the ministry's approach to recreation. "We provide rustic, user-maintained campsites and picnic areas without duplicating services offered by private campground operators, the Ministry of Highways or the Parks Branch. Typically we'll have a campsite or picnic area, say near a good fishing lake up some logging road.

"We also provide support for backcountry recreation and are slowly producing an inventory of recreational resources — lakes, hiking trails, good ski areas, that sort of thing.

"The interest in cross-country skiing has mushroomed over the past few years. These trails here, and the two day-shelters were developed by local clubs. We only took them over when there was concern about the clubs limiting the use of facilities on public lands. There's always someone on the trails, every day of the week."



The once bustling mining community of Sandon is now a ghost town and local tourist attraction (above), ***testimony to the fact that the Kootenays live or die by their natural resources. Land-use planning for the Valhallas must fit the broader picture of overall land use in the Kootenays where both the forest industry and recreation*** (opposite page) ***figure prominently.***

North of Slocan Valley, on the Arrow Lake System, the small logging community of Nakusp feels the disadvantages of being a single-industry town. Through the 1981-82 depression in the wood market, unemployment in Nakusp skyrocketed, businesses failed and the local economy came to a near standstill.

From his mainstreet office one sleepy winter afternoon, Ken Marshall, a Nakusp real estate agent and member of the Chamber of Commerce, gives his opinion. "In the long run here we're going to have to rely much more on tourism. It's the only way out of this boom or bust resource economy we have now. There's lots of tourism in the area, but we don't have much to keep them here, except the Nakusp Hotsprings. That helps, but we need more."

Marshall is interrupted suddenly by a thrashing roar low overhead. "That's the only economic bright spot in town these days," he says, gesturing skywards. "Helicopter skiing is really helping the restaurants and hotels."

Tad Derbyshire, owner of Kootenay Helicopter Skiing, spent part of his childhood in Nakusp and loves it there. "We offer two things," he explains. "Some of the best wilderness skiing in the world — powder snow, deep and steep and lots of it — and the beauty and atmosphere of small-town B.C."

Another type of wilderness skiing gaining popularity is snow-cat skiing. By using snow-cats (multi-passenger, enclosed tracked vehicles) in place of helicopters, and by offering good ski runs and homecooked meals in rustic lodges, operators are attracting customers from all across North America. Valhalla Mountain Touring — run by Pettitt and his partner Grant Copeland — operates out of their lodge eleven miles up Shannon Creek in the Valhalla Range, just north of the proposed park area.

When the topic of backcountry skiing comes up, foresters point out that snow-cats normally make their way into wilderness areas on old logging roads, and that a lot of skiing takes place in clearcuts.

Copeland, a planning consultant in the off season, talks about the future. "All of us involved in tourism in the area want to retain the rural atmosphere, people come here for the beauty and the atmosphere. Nobody is against logging or mining. But tourism could be and should be an important partner in the local economy. I just hope we get past this stage of everybody fighting each other."

Craig Walden *of Forintek Canada*

by **Gordon Price**

Forintek Canada Corporation is in the business of sharpening the forest industry's competitive edge — sometimes quite literally. As Canada's national wood products research organization, with laboratories at the University of British Columbia and in Ottawa, it concentrates on improving technology in the industry.

That might mean coming up with a sharper saw, getting it into the mills, and training the operators. It definitely means inventing new products and looking at better ways to utilize wood.

The man in charge of Forintek's western wing is Craig Walden, a soft-spoken Saskatchewan native who has been overseeing a major transition in the 65-year-old organization.

Originally established in 1917 to provide research for the federal government, the Vancouver Laboratory evolved into the Western Forest Products Laboratory, researching such topics as wood science, wood preservation, adhesives, and sawmilling. Four years ago the federal government decided to turn over the responsibility for forest products research to industry, along with the laboratories and staff that became known as Forintek — short for forest industry technology.

Forintek's board of directors combines senior people from government, industry and universities. Funding is provided by the federal government, provincial governments (the largest such contributor being B.C.), the forest industry, and outside contracts.

Reorganizing as a private institution required a shift in approach to research — from "mission" research to "contract" research. In the first case, the scientist decides on a project; in the latter, he works at the specific request of the client.

One of Walden's special concerns is the quality of second-growth wood — the fast-growing fibre that will be coming out of our intensively-managed forests that have been restocked, using new generations of genetically-improved seedlings.

FORESTALK: You have expressed some concern about the quality of wood coming out of our second-growth forests. What's the problem here?

WALDEN: We do have some considerable concern about the quality of some of the second growth.

It is not sufficient merely to ensure that our forests are restocked and trust that the quality of the wood produced will be the same as that of the original stock. The tree breeders are obviously looking to replenish the lost volumes in the shortest possible time. It may help less if it turns out that they have replaced them with inferior wood.

We are also very concerned about some of the strength properties of second-growth materials, particularly Douglas fir — the base of our industry. When you come up with three rings that are wider than the veneers that go into plywood, you have to have some concern about the quality of that plywood. Wide rings can mean weaker veneers, hence weaker plywood.

FORESTALK: What is Forintek doing about this problem of quality in second growth?

WALDEN: We are developing techniques to measure density, probably the prime factor affecting wood quality, and we're quite strong on that.

We are doing exploratory studies to determine what the quality will be and how to maximize it.

FORESTALK: If you had a blank cheque and were asked to plug some research holes, are there any favourite holes you would like to fill?

WALDEN: My own immediate concern is the development of the necessary data for light-frame construction — two-by-fours for instance — in situations which use second-growth materials. It may seem surprising, but we don't have all the raw data that we need, particularly with our second-growth stands.

> *"We do have some considerable concern about the quality of some of the second growth. It is not sufficient merely to ensure that our forests are restocked and trust that the quality of the wood produced will be the same as that of the original stock."*

The reason for this lack of information is because it's expensive to take a two-by-eight 12-foot piece of lumber and break it in the middle for testing purposes. Years ago, people said, "Let's not break this expensive piece of lumber. Let's take a smaller piece and try to extrapolate what a large piece will do." In the last 10 years we have found out that this approach does not work.

So here we are, in the position of trying to increase the competitiveness of our product and we still don't have enough basic data. Even if we developed the systems for utilizing the information, we don't have the basic data. This is one of the greater urgencies for Forintek.

FORESTALK: Are we at the forefront of the technology we use? Will we remain competitive because we have a technological advantage from the research that comes out of your laboratory?

WALDEN: We would like to think so. Certainly we have some of the best scientists available. We have Dr. Foschi on staff who has just been awarded the Marcus Wallenberg prize for 1982, a very prestigious international prize for outstanding contributions to forestry research throughout the world. The only other technical prize I am aware of in the same monetary range — $100,000 — is the Nobel Prize.

FORESTALK: What did Dr. Foschi accomplish?

WALDEN: His work is a unique contribution. Wood has been losing ground over the years to building materials such as steel and concrete — relatively uniform materials that allow you to design for specific loads in a building. This has not been economically possible for wood because it's such a variable material. To allow for this, most people in construction over-design. If wood is not to continue to lose ground, it becomes very critical that you are able to design for safety but not waste a lot of material.

This is what Dr. Foschi has done; he has been able to take wood, with its knots and cracks and twists and warps, and to put all this into a mathematical format for computerization that allows the engineer to design a structure that uses the minimum amount of material and yet guarantees that it will be safe. And that's without getting into computer programs that run for three months.

FORESTALK: How did you and your staff make the transition from government to industry ownership?

WALDEN: We had been working for the federal government and producing what the federal government wanted; so there was some natural concern among the staff about their capabilities to produce exactly what industry wanted. Could we attract the necessary money? Would industry back us again? Until you have done it a few times, you don't have that confidence.

FORESTALK: What *does* industry want?

WALDEN: They make it quite plain that the major activity here in western Canada is the manufacturing of lumber. If we help them improve the technical basis on which they manufacture lumber, they almost don't give a damn what else we do. The fundamental change is that now our industry owners know they are running the place and they know they're helping to pay for it directly. There is a sense that we belong to them.

FORESTALK: You said that in order to establish your credibility, you needed a few successes. Have you had them?

WALDEN: Yes. The finger-jointing technique came out of our laboratory. Pieces of wood too small to be sold as lumber can be joined together with glue to produce, say, a two-by-four. Otherwise the wood could only be chipped for pulp, at a considerable loss in value. We're trying to exploit finger-jointing by machine-grading the lumber.

Most mills grade wood by using lumber graders who look for factors that affect strength and appearance. Machines do the same thing more accurately by measuring the flexibility of a board and then predicting its strength. Since normal finger-jointing combines pieces at random, the finished board is only as strong as its weakest link. Machine grading allows you to use consistent grades, rather than mixing those of high and low strength.

You're talking about an improvement in grades, which means an increase in strength, which means an increase in price in the order of 10 percent.

FORESTALK: How quickly does something come from your lab and get out there into the mill?

WALDEN: Most research takes 10 to 15 years to get out. But we get to it a lot quicker. Within the last year, we examined a new technique for sharpening saws. This may seem mundane, but it's really very critical.

It's not feasible to get in and change a bandsaw in a mill more frequently than every three or four hours. So if you have a saw that runs nice and sharp for a short time and then tails off in sharpness, you have to make an allowance for the lumber that comes out at the end of the cycle when the saw is dull. If you come up with a saw that retains its sharpness for a longer period of time, the allowance will be much less and you'll save more material.

We have developed a method of tipping saws with an alloy so they don't need to be sharpened as much. And we have a program to take this into the mills — for an investment of as low as $30,000 for the average mill. I regret to say that the first mill to have it in place was in the State of Washington.

FORESTALK: Why wasn't B.C. implementing it?

WALDEN: I really don't have an answer for that. Obviously, it's a question of transferring the technology. You can take it to top management and say: "Oh boy, here's a 10 percent increase in productivity. Go and do it." Well, you also have to convince the guy who is going to do it, and you have to show him how to do it.

FORESTALK: Is this a consequence of the inertia of large institutions, whether they be private or public, to continue the way they've been going? You have the technology here, and it seems to be working. What is industry doing? Waiting for others to use it first?

"We had been working for the federal government and producing what the federal government wanted; so there was some natural concern among the staff about their capabilities to produce exactly what industry wanted. Could we attract the necessary money? Would industry back us again?

WALDEN: Human beings are great copiers. Take finger-jointing again. It started off being used in smaller mills that found it easier to re-orient themselves. B.C. has a large number of smaller industries, so the chances of finding somebody willing to take a risk is greater.

But if we were talking about a $30 million investment, that would weed out the smaller mills. Converting to a new technology would take longer because you're much more careful if you spend $30 million than if you spend $30,000. I don't know if there is a rule that says the bigger the investment, the longer it takes people to make up their mind — but that's how it works.

Our emphasis has been on the development of smaller systems, which are maybe not perfect but can achieve much of the same gains as large systems, with much smaller investments of both equipment and competence.

FORESTALK: If you are able to increase productivity by reducing the number of workers, or keep it the same, what does this imply for employment in the future?

WALDEN: I don't want to sound callous, but we're not a social research organization. If you want to take the long-term look, social impacts that have happened have been on the positive side. We still have the same resources that were in this country 200 years ago and we have a much better standard of living for a very much larger number of people. While I recognize the consequences and concerns, this is quite frankly not in our terms of reference.

FORESTALK: What about the quality of our labour force?

WALDEN: Tremendous. In B.C. we have a high level of education and understanding. When you go to find operators and train them, there is no difficulty. There are very few instances where there are shortages of skilled manpower.

FORESTALK: Part of what is happening here seems to be that you're making the technology easier to use. You don't need a PhD to run a computer in the mill.

WALDEN: Any time you designed a system that required a PhD to run it, you had to scrap it.

FORESTALK: How badly are you being hurt by the current recessionary economy?

WALDEN: Like everyone else, we're bleeding. We've been fortunate in that federal and provincial support hasn't been cut back. But the industry is keyed to production and this has dropped.

FORESTALK: What are you doing in response?

WALDEN: Rather than dropping specific projects, we're dropping the overall level of our research. But we've been careful in trying to protect the high-priority projects that provide immediate cost reductions to the industry.

FORESTALK: What does the future hold for you? How will you be coping?

WALDEN: Research can't be turned off and on like a tap, and we do have a contract with the federal government for a base of support until 1984. We've already started negotiations with them for the renewal of their support.

FORESTALK: Given an upturn, what new fields will you be moving into?

WALDEN: We are increasing our activities in manufacturing technology. The other major field is to help improve the utilization of the resource.

FORESTALK: Is what you do important to the average British Columbian?

WALDEN: It is very important to keep the forest products industry of B.C. competitive. This is why we are here. We can provide the technical input to keep that competitive edge, to increase that productivity. Let's face it, the edge that you find in the business place is not one of magnitude; it's a very thin edge. We can help sharpen that in some slight way.

COLLECTIONS

How the North Was Won

Cutting Up the North (Hancock House, 1981) is no picture book about colourful loggers, but a business-minded portrait of a modern, developed industry. Ken Bernsohn's history of the Prince George forest industry delivers the goods on how the system really works.

The northern forest industry started at the turn of the century, on the crest of a land rush along the route of the promised Grand Trunk Pacific railway line from Edmonton to the Pacific coast. Prosto! Prince

George comes into being. Bernsohn recounts some great stories about the rugged early days of Prince George. More recent economic policies have had an even greater impact on the region, as a middle chapter entitled "Genesis" shows. Bernsohn claims that two innovations in particular — the practice of awarding a quota of Crown timber to established operators, and the offer of timber to companies building pulp mills — have changed the way business is done in the north by promoting the establishment of bigger companies and by cutting down the competition for timber. It's strong reading, but laced with humour — as when Bernsohn paints a picture of the mythical old-style "man with six strong sons and a bush mill."

Cutting Up the North is most revealing in its tour of company boardrooms. "Once you get away from the concrete canyons of Vancouver and the peer pressure of industry executives who lunch together, you realize that each company has its own identity." A standard line in the industry is northern companies have more character than those in the south. That's because they're full of characters.

Bernsohn saves some of his juiciest insights for the last chapter, aptly titled "Secrets." But the whole book is full of the same realistic appraisal, from which no special interest or party is excused. "The real world is one of less-than-perfect people, less-than-perfect policies, and all-too-perplexing problems," Bernsohn says in summing up the history of the northern forest industry.

New Plant

Last year MacMillan Bloedel forest ecologist Bill Beese discovered a small greenish flower in a bog on the Queen Charlotte Islands. Nothing unusual about that?

Well, it's the first time *Malaxis monophyllos* has been found growing in the Queen Charlottes, and the first time the variety *brachypus* has been seen in Canada. As a matter of scientific fact, Alaska + Aleutian Islands is the only other place "adder's mouth" in "white malaxis" has been found and collected.

Like all such finds, pressed specimens of the plant are stored at the University of British Columbia Botanical Garden. The garden's director, Kee Taylor, author of the authoritative *Flowers of the Queen Charlotte Islands*, confirmed Beese's find, and Beese also wrote an article for *The Canadian Field Naturalist*, announcing it to the world of natural history.

Since 1977, when the U.B.C. Botanical Garden staff first published a list of 3,137 plant species found in B.C., new ones like the redwood sorrel and the white malaxis orchid have turned up, but one species — a kind of maidenhair fern — has been written off. "The dogwood-type trillium plant and the rhododendron bushes growing in the Skagit Valley are the only publicized non-commercial plant species in B.C.," notes Taylor.

As for Bill Beese's wildflower species other valuable clues about the ecology of forestland sites. "An orchid found only in bogs is probably not very useful to MacMillan Bloedel, but many plants are indicated plants — groups of plants can be used to describe the moisture, temperature and nutrient requirements of a site for forest management purposes."

Cooking With Cambium

Trees are edible, if you know what part to eat. Consider cambium. This pulpy layer of growing tissue between the wood and inner bark has long been recognized as a rich source of vitamin C. The Bella Coola Indians scraped cambium off hemlock trees, wrapped it in skunk cabbage leaves, steamed it in bio-pits, then rolled it into balls which they dried in the sun and stored. Softened in water the cambium cakes made a winter staple that could be served with, for example, grease and salmon skins. If that doesn't tease your mouth-waters, try cambium gathered in late spring, cut into narrow strips and cooked like spaghetti. Raw very fresh cambium can be simply eaten off the tree — a meal of last resort that has saved hundreds of lives, according to Bradford Angier, author of *Free for the Eating*. Cambium from spruce, pines, larch and poplar have the same qualities. Early settlers reportedly rendered aspen cambium into a quinine-like drug that was intensely bitter-tasting but useful for controlling fevers.

What Weevil Lurks In The Tops Of Sitka Spruce?

"What in this world can a beetle see?"

With that question, writer and biologist Terry VanderSar of Vancouver found himself looking at the world with a weevil's eye.

"My subject was the Sitka spruce weevil, a small, brown beetle that feeds and deposits its eggs each spring in the leader of spruce trees."

This tiny insect has such a devastating effect on new Sitka spruce plantations that serious consideration is being given to abandoning any future plans for planting Sitka spruce, at least on Vancouver Island. While the weevil does not kill the tree, the infection it produces causes a deformed growth, making the tree unsuitable for log-

"I stapled pairs of black cardboard rectangles to the inside circumference of a large white cardboard cylinder. In each experiment, small groups of weevils were released on the floor in the centre of the white cylinder. Only eyesight could guide each insect in making its choice to crawl towards and then climb one of the rectangles.

"The first pair of rectangles were the same height; the beetles chose the wider one. The second pair were the same width; the weevils preferred the taller one. And the weevils climbed only vertical — not horizontal — rectangles.

"In my three experiments, the black cardboard rectangles are fair approximations of spruce tree leaders. The results indicated that the insects are attracted only to leaders that are erect, tall and fat. The beetles rejected leaders or rectangles that were thin, short or lying on their sides (presumably, these horizontal "leaders" look more like spruce branches.)

"Why not give the weevils a choice between six different rectangular shapes, all equal in area but with different dimensions? The beetles made a choice that was clear cut. They preferred the rectangle that measured three centimetres wide.

"Painfully (for Sitka spruce needles are very sharp,) I then measured the diameter of no fewer than 495 different spruce leaders in a tree plantation. Their average diameter was 3.07 centimetres.

"The result astonished me. With their comparatively simple nervous system, these small beetles are programmed to search for tall, erect spruce leaders that measure about three centimetres in width.

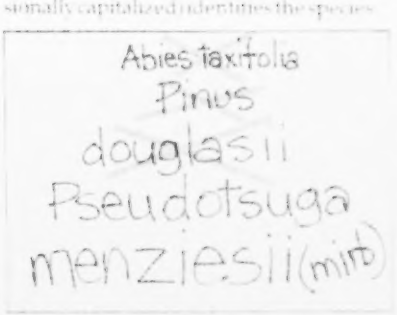
"In its world, the Sitka spruce weevil sees only what it needs to see to ensure its own survival."

spruce weevil

What's in a Name

"*Pseudotsuga menziesii*? It sure looks like a Douglas fir to me."

Until someone comes up with a better way to distinguish the world's several million types of plants and animals — there are over 190,000 species of flowering plants alone — scientists will continue to use the Linnaeus classification system of double-barreled Latin names invented by the Swedish botanist Carl von Linne 200 years ago. In principle the system is simple: the first word (always capitalized) gives the name of the genus; the second name (occasionally capitalized) identifies the species.



In the case of lodgepole pine (*Pinus contorta*), the "contorta" is one of several species of the genus called "Pinus." And there are five progressively larger groupings as well.

The Botanical Code, or International Code of Botanical Nomenclature, lays down the law when it comes to naming plant species. (Separate codes govern the names of animals, microorganisms and cultivated plants.) Proposals to name new species have to be backed up with specimens and published descriptions of the species' characteristics, then registered with the International Association for Plant Taxonomy in Utrecht, Netherlands.

This system is essential to the orderly naming of plants, but it can sometimes generate its own confusion. After Archibald Menzies discovered the Douglas fir in 1791, it was first called *Abies taxifolia* (type of true fir). Later it was called a pine (*Pinus*) and given the name of Douglas' *menziesii*, in honour of tireless English botanical collector David Douglas. Still later the generic name *Pseudotsuga* was applied to it when it was realized Douglas fir was different, and quite rare, genus.

Confusion continued to abound until 1950, when a Portuguese scientist named Franco unearthed a description of the tree published in the early 1800s by Mirbel. Today the tree's full name is *Pseudotsuga menziesii* (Mirb.) Franco — deservedly giving the person who discovered it (Menzies) the first person to describe it correctly (Mirbel), and the detective work to Franco.

For 673 years, governments of the western world have been trying to balance the volume of wood cut in their forests with the amount growing back. But in a lot of places, including British Columbia, "sustained yield" has proven to be a most elusive goal.

Reporting on this fundamental issue is freelance writer Ken Bernsohn. As author of Cutting Up The North *and past editor of the influential newsletter,* Forest Insight, *Bernsohn has earned a reputation as a respected, if sometimes controversial, forestry writer.*

IS SUSTAINED YIELD JUST ANOTHER MYTH?

by Ken Bernsohn

"Sustained yield means that treeplanting and harvesting have to be in balance." — Richard McAlary, B.C. Central Credit Union Chief Economist

Back in 1309, Henry VII of Germany passed a law saying that if a forest was stripped of trees, it had to be replanted. The law didn't work.

In Saxony, in 1700, a Royal Ordinance demanded that before a prospective bridegroom could marry, he had to plant a certain number of oak trees. This improved acorn sales, but the size of the forest kept shrinking.

For 300 years England went on proving that speeches in Parliament didn't plant trees. France demonstrated that the passing of forestry laws required paper, and that killed trees. Austria tried taxing people who cut too many trees.

Finally, in 1848, Saxony actually tried sustained yield in a state forest. The volume of tree growth was measured each year so foresters could judge how much wood to cut annually without diminishing the forest's overall size. At the time, British Columbia's virgin timber supply seemed to be inexhaustible. Little interest could be drummed up for the idea of managing growing forests.

In 1910 the first B.C. royal commission on forestry suggested that sustained yield might eventually be a good idea. In 1945, "eventually" finally arrived when Chief Justice Gordon McFarlane Sloan reported that sustained yield — as he defined it in his royal commission report — indeed was a good idea. His tongue-tripping definition was: "A perpetual yield of wood of commercially useable quality from regional areas in yearly or periodic quantities of equal or increasing value."

But for a great variety of reasons B.C.'s timber reservoir has continued to drop.

This decline in virgin timber used to be standard procedure around the world. Israel and Scotland used to have huge forests. Even Sweden ran into trouble. "At the beginning of the present century, Swedish forestry was headed for disaster," notes Stig Hagner, the director of forestry for Svenska Cellulosa, Sweden's biggest forest company. In the 1930s in the north of Sweden, "the older forests consisted mostly of sparse remains of virgin forest. There was hardly any young forest of decent quality at all."

But today, Sweden can harvest 70 percent more trees annually than it could 30 years ago, without reducing the forest size. And Hagner adds: "In 50 to 60 years our company will be able to almost double its annual harvest."

New Zealand has built up a huge, healthy forest that's almost ready to start being harvested. In Norway and Finland the size of the forests has increased so much that neither country currently uses up as much wood as it grows — and these are countries whose forests were hard hit by the effects of World War II.

Meanwhile, in B.C., foresters, industry executives and politicians are at (ahem) loggerheads over just what "sustained yield" means. For an economist's view, take the definition offered by Richard McAlary, chief economist for the B.C. Central Credit Union: "To me, sustained yield means maintaining the output at the current level; that means treeplanting and harvesting have to be in balance."

Bob Nixon, a spokesman for both Greenpeace and the Sierra Club, comments: "If you look deeply, that kind of definition means that we can cut the last mature tree, removing all jobs and exports, as long as there are young trees growing back.

"When someone says 'sustained yield,' I immediately think of ritual; myth; public manipulation."

How would you define it?

"To me, 'sustained yield' means a continuous supply of a variety of goods and services from the forest land base: a continuous amount of harvesting of wood, a continuous supply of deer, caribou, salmon, hiking trails and other values."

Does 'sustained yield' mean cutting the same number of trees every single year?

"No, but it means cutting within well-understood limits."

The man responsible for the federal government's involvement with the forest is Les Reed, Assistant Deputy Minister of the Canadian Forestry Service. "You want me to define 'sustained yield' for an article in *ForesTalk*? Hold on. It says here in *Forest Management in Canada*, 'sustained yield' implies continuous production with the aim of achieving, at the earliest practicable time, an approximate balance between net growth and harvest, either by annual or somewhat longer periods."

Do we have sustained yield in B.C.?

"Not one province in Canada is practising sustained yield on all its lands. But there are some notable exceptions. In Canada we have some of the best forests in the world, and some

"When someone says 'sustained yield' I immediately think of ritual; myth; public manipulation." — Bob Nixon, Greenpeace and Sierra Club Spokesman

of the worst neglect."

All this bickering over definitions may seem unimportant, but unless people agree on what sustained yield is, there's no way to know whether we have it or not, or if it's a good idea.

The man in Victoria who decides how much wood can be cut in B.C. each year is Chief Forester Bill Young of the Ministry of Forests. He has his own definition of "sustained yield," and his is the one that determines which trees will stand and which will fall: "Sustained yield is really the rate of harvest — of wood, wildlife, recreation and other resources — that can be produced from the net productive land base as defined *today*, reflecting *today's* programs and policies."

Can you run that by me again?

"The key point is this: the size of our forest keeps changing. In 1900 we thought we knew what merchantable timber we had in the forest, but we really didn't. In 1956 we had a better idea of what our forestland could produce. On the other hand, some of that forestland has been put to other uses. And every time a road gets built or a tree dies, the size of the forest — and the harvest you can get from it — changes.

"It changes again when policies change. If we decide to maintain as big a herd of caribou as possible — that will affect the timber harvest. Policies will assuredly change in the future, whether you're looking at wood or wildlife, hiking trails or salmon. As for programs: if we had $600 million for tree improvement, for example, that would certainly increase the rate of harvest over time."

From his office in Sundsvall, Sweden, Stig Hagner provides a European perspective. (The telephone operator really does say "Canada calling," just like in TV commercials, so that people in other countries will realize that speaking English might be necessary.)

"There are various definitions of 'sustained yield.' It is not a very sophisticated idea and there's a lot of misunderstanding about it. In British Columbia, you've been working to make sure the forests aren't exhausted, but very little has been done to improve the resource. You've been practising husbandry. But as demand increases and the situation — due to the old way of handling the forest — is worsening, the interest in bringing up the forest yield increases. You're now at that stage. And you have a tremendous potential, especially on the coast and in parts of the interior. In Scandinavia, in the long run, we'll be able to almost double our annual harvest. That could be done in B.C."

Chief Forester Bill Young has battle scars from years of dealing with the issue. "Sustained yield is possible as long as we remember that our knowledge of what's possible changes over the years. Hemlock and lodgepole pine are now considered valuable. They used to be ignored as 'weed species.'

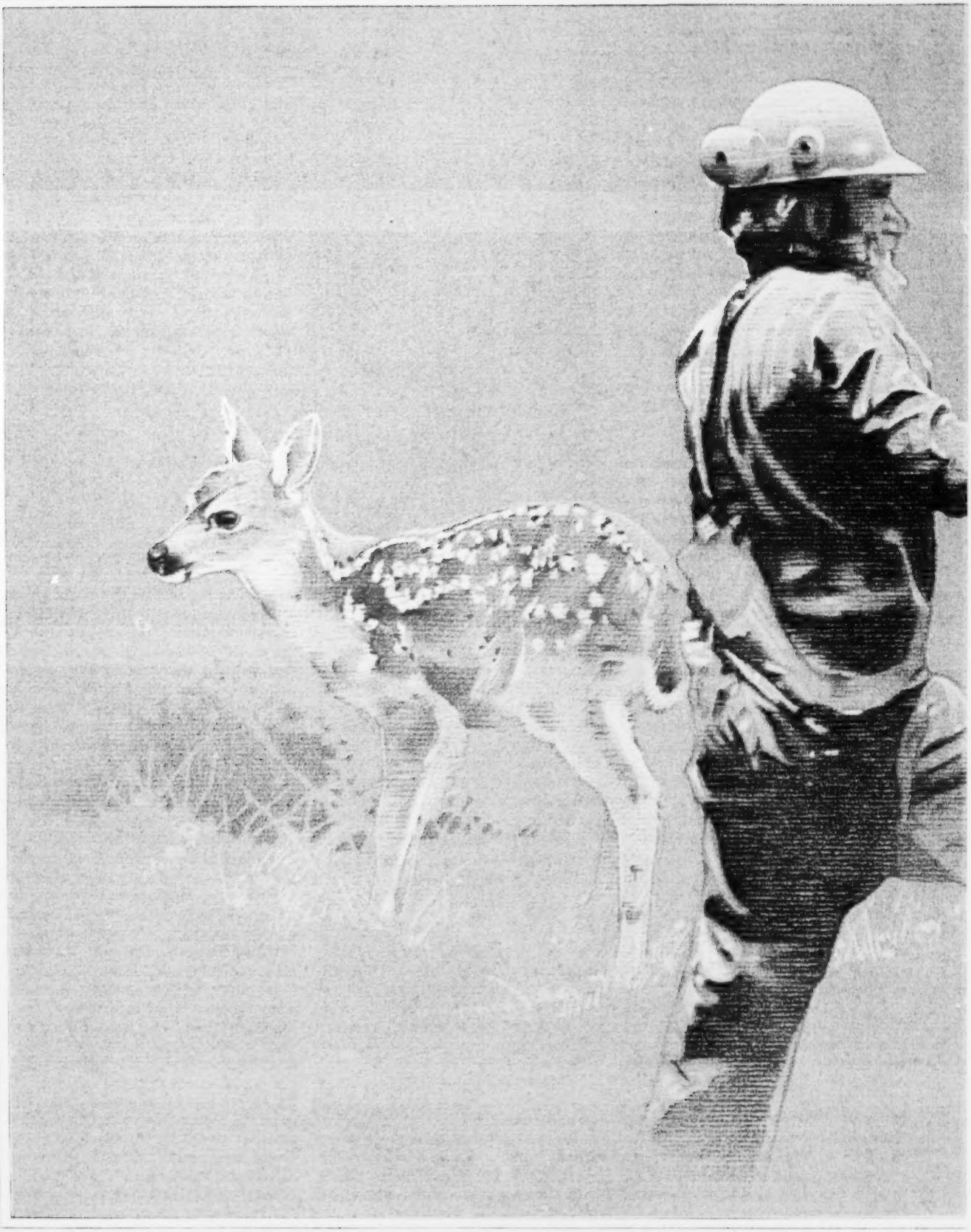
"Sustained yield is practical if policies, programs and funding are positive. But if all you have in the forest is older trees past their fast-growing years, or nothing but seedlings, you've got problems. The theory of sustained yield is to harvest annually those trees that are just reaching the right time in their growth cycle to be harvested. That would mean good wood for the mills, good food for the deer, and a good-looking forest for visitors. It would even be more bug-resistant than an old forest. But British Columbia's forests are comprised of a high percentage of old-growth timber. Too much old growth means, under sustained yield, that a lot of old trees will be harvested by bugs. Speed up the harvest to get the wood before the bugs do and you get good wood now, but have less timber later on."

Would more money help?

"Sure, but money alone won't solve the problem. We're dealing with an age gap in our forest and a knowledge gap in a lot of people's minds. The decisions made 25 years ago were good . . . for the time. The best decisions we make today may be wrong 25 years from now. We have to make periodic re-evaluations, and for the first time those are being done on a regular, five-year basis. Although much more remains to be done, we're making progress. More seedlings have been grown and planted in the last two years than from 1900 to 1950. We have more information about the forest. We're using more of the wood from each hectare harvested."

Since the turn of the century the B.C. government has used its forests

> *"The forest belongs to our children. It's up to us to leave it in a better condition than we found it." — Les Reed, Canadian Forestry Service Assistant Deputy Minister*



as a source of revenue to pay for schools, hospitals, roads and other services British Columbians need. That means only a small portion of the money generated through forestry has gone back into renewing the forests.

Through the years the province has built up a backlog of logged areas that never grew back into productive forests. The cost to rehabilitate that land today, if it were to be done all at once, has been estimated to be as much as $4 billion. Who can pay that kind of money?

"In the first instance the landowners should pay, of course," says Canadian Forestry Service's Les Reed. "Those who benefit from the wise use of the forest and its conservation should also pay. That means industry and the federal government should contribute."

In soft tones, Les Reed has stuck a stick in an anthill and stirred up the inhabitants. At a recent national forest conference in Banff, a lot of industry and provincial government representatives complained that the federal government, whose spending on forestry since 1969 has declined in real dollars, isn't carrying its share of the forestry load.

Says Richard McAlary: "The users of the products ultimately pay; the guy who buys lumber or paper. Whether the government or industry levies the charge, it's the user who ends up footing the bill.

"I have no problem spending money for the future, especially when we're in an economic slump. Reforestation is especially good because we're certainly not going to glut the market or produce a product people can't afford. From a fundamental economic point of view, you can't run down the factory; you've got to keep investing in it."

Bob Nixon feels that industry should finance sustained yield, saying: "The money can come from the province charging a rational fee based on the value of end products made from the trees that the government provides."

Stig Hagner partially agrees. "In the next one or two decades, people will be able to see the value in a global perspective. Industry will be able to pay for these forest measures, if they can be assured that the resources will not go away."

But that phrase, "will not go away," is why industry doesn't want to foot the forestry bill alone. In B.C. most of the timber belongs to the government, and the government has the right to say who gets it. The standard industry line is: "How can we be sure that we'll get the benefit from the money we spend?"

> *"Sustained yield is really the rate of harvest - of wood, wildlife, recreation and other resources - that can be produced from the land base today." — Bill Young, B.C. Ministry of Forests Chief Forester.*

One way is to spend government money. There are two sections of the forest act that let companies spend money on the forests and get a credit toward what the forest ministry charges them for the trees they harvest (stumpage). This has led to the creation of 38 new forestry nurseries, including one on top of a sawmill in Quesnel. That's a big step toward sustained yield.

Another step is the federal-provincial forest employment program used to improve B.C.'s forests. Still another step is a lowering of the total volume of wood that can be cut each year by industry.

"I'm not saying everything's perfect," Bill Young says. "It never will be. But more is being done than ever before. And if we continue this rate of progress we'll be able to supply deer, wood and recreation. But we must keep improving."

Notes Northwood forestry vice-president Doug Little: "Somewhere along the line you can reach a level you can sustain. To despair and give up would bankrupt the province. We have a tremendous potential in the land for better, faster, larger forests, but I don't have a simple solution to the problem."

No one has, yet. But it's a problem we have to solve.

The Forest At Night

Photo Essay by
Gary & Judy Green

Daylight fades as the sun settles in the western sky. A curtain of darkness descends on the still forest. As the moon crests over the tree tops the owl calls, announcing his night flight. Bats dart about catching moths on the wing.

The night choir gathers. A Pacific tree-toad inflates its resonating sac that swells its throat three times the size of its head. The combined chorus of several of these amphibians can be heard for some distance, joined by the rubbing legs of the cricket section.

The forest floor at night is host to a myriad of life and death struggles.

Deer mice scurry along the forest floor collecting seeds. A precarious ramble: the deer mouse forms the staple diet of many a forest predator.

short-eared owl

Before the night passes many will fall victim to the owl. And nature will remain in balance. Moist forest floors are the gathering places for slugs and snails which feed on the richness of decaying vegetation. Lying in ambush, however, is the large ground beetle. This armoured hunter kills his quarry with powerful crushing jaws. When attacked himself, he retaliates by emitting a repugnant liquid to assist his escape.

Ground spiders, unable to spin elaborate webs, sit motionless, waiting for an unfortunate victim to wander by. With great dexterity a spider grabs its prey, infecting it with a paralyzing venom. Juices fill the prey's body cavity and break down the tissue which the spider sucks out. Only the external shell of the insect remains.

Earwigs and sow bugs feed under logs and rocks. These in turn are prey for the hunting centipede which winds its way along the forest floor on several sets of legs.

At dawn's first light the creepers of the night recede to their place of hiding, waiting for the curtain of night to fall once again.

wolf spider

earwig

ground beetle

deer mouse

Making Fire Work For Us

Wildfire is a dreaded enemy of a timber-dependent province, and when the Forest Service was established in 1912 it emphasized the prevention and fighting of all fires in the forest.

More recently, forest, range and wildlife managers have been using fire as a land management tool. *Prescribed fire*, as it is called, can help grow better forests as well as create better habitat for wildlife and domestic animals.

Fire in Nature

Fire is a normal, natural process. Through evolution and exposure to wildfires, many plants have adapted to fire. Some actually depend on it.

Trees like western larch, Douglas fir and ponderosa pine have developed bark so thick that it insulates living tissues, saving them from being destroyed by most fires. Lodgepole pine release their seeds in abundance when exposed to wildfire. The pine cones can remain for many years until intense heat melts the resinous material that holds the cones' scales together.

Wildfires often create excellent conditions for new forest growth by releasing the nutrients locked in logs and other organic material.

Fires can open a thickly-treed forest, letting in the sunlight to encourage the growth of shrubs and grass — forage for wild and domestic animals.

Some species of wildlife, such as moose, deer and elk, benefit from the browse created by fire. Wildfires can also provide many small animals and birds with both food and cover.

Wildfire changes the composition and density of the forests and sometimes turns whole sections of forestland into grassland. Wildfire can affect water quality and quantity in entire watersheds, and it can also have an affect on recreational resources and natural aesthetics.

In 1982 almost 32,000 hectares of forest were burned for silvicultural purposes.

Fire in Forestry

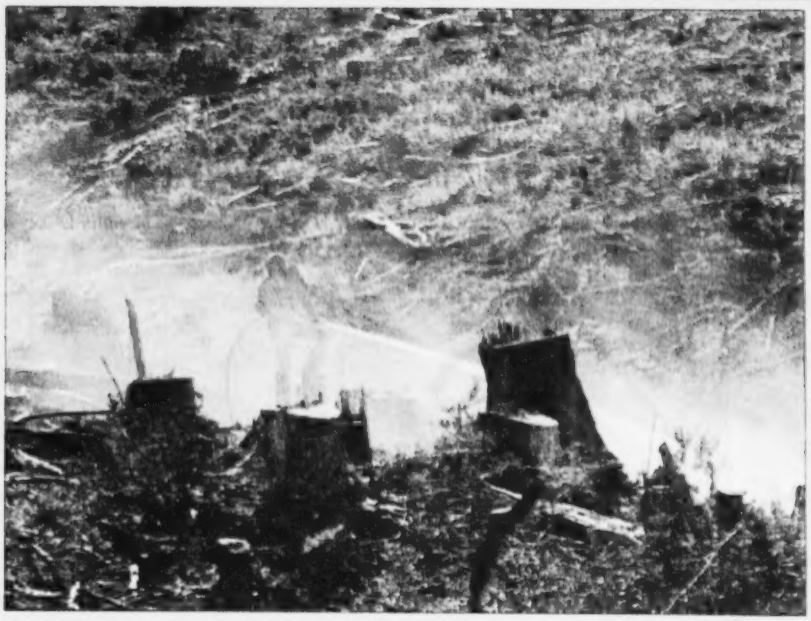
There's hardly anyone in B.C. who hasn't used a form of prescribed fire at least once: to burn leaves or garbage, perhaps, or to burn brush on a building site. Farmers burn to clear their land; orchardists burn the branches they prune from their fruit trees. But the value of prescribed fire in forestry goes far beyond getting rid of debris.

* *Prepare forestland for planting.* Broadcast-burning a site soon after it is logged is a cheap and efficient way of preparing the area for a new crop of seedlings. Besides speeding up the rate of return of nutrients to the soil, burning opens up access to the ground for treeplanters. Burning can expose mineral soil, making it easier for seedlings to get established. Burning can also keep down weeds and other competing vegetation long enough to let tree seedlings get a good start on life.

As a silvicultural tool, burning is generally preferable to the use of machinery for preparing planting sites because machinery can affect soil productivity by compacting or displacing the organic and nutrient rich soil layers.

Prescribed burning can also reduce the need for the use of chemical herbicides to control unwanted brush and weeds on new planting sites.

The Ministry of Forests intends to plant over 130 million seedlings annually by 1986, and prescribed fire



Controlled fire affects the soil in ways that both promote and improve new tree growth.

A half-hour film on prescribed burning entitled "Black and Green" is available from the Ministry of Forests, Information Services Branch, 1450 Government St., Victoria, B.C., V8W 3E7.

Land managers use prescribed fire to create and enhance grasslands for wildlife.

will play an important role in reaching that goal.

* *Control outbreaks of disease and the spread of insects.*

Various burning techniques can be used to control insect pests and diseases in the forests. This is especially critical when you consider that, in recent years, more than five times as much timber has been lost to insects and disease than has been consumed by wildfire. Research indicates that woodsmoke itself may limit the growth of some fungi and insect populations in forests.

* *Improve habitat for wildlife and grazing for domestic animals.*

Both forest and range managers are making more use of prescribed fire to provide browse and forage, especially for ungulates. Prescribed fire is a key component in the Ministry of Environment's wildlife enhancement program, and throughout the province wildlife managers are using fire to maintain, create and improve grasslands for the benefit of both wildlife and domestic range animals.

Planning the Burn

Given the potential social and economic impacts of prescribed fire, it is important to have a firm understanding of fire's immediate and long-term effects on the environment. And one of the most important lessons in fire management is that each forest site (and virtually each plant species) responds to fire in different ways.

In planning a prescribed fire, resource managers must pool their expertise and agree on a set of goals that relate to the ecology of the site as well as to the use people make of it.

Often a single prescribed fire can suit more than one land management objective. The same burn might reduce a fire hazard by getting rid of logging debris; prepare a site for planting; improve domestic range or wildlife habitat; and even serve to control forest insects and diseases.

Managers must also consider how prescribed fire might affect the area surrounding a site. Will it endanger other forests, stream banks, or lake shores? Will it lessen the aesthetic appeal or recreation potential of the area?

With all these factors in mind, in 1982 almost 32,000 hectares were burned for site preparation and other silvicultural uses. Burning logging debris to reduce forest fire hazards took place on another 6000 hectares, and 5000 hectares of domestic rangeland were burned to improve forage for cattle. In addition, wildlife managers burned thousands of hectares as part of the wildlife habitat enhancement program.

More and more is being learned about fire management all the time, but one fact is certain: prescribed fire is an invaluable tool in wildland and forest management.

Controlling the Burn

Prescribed fires are governed by a list of strict guidelines regarding things such as weather, topography and the condition of the forest fuel. The land manager must be concerned with the ignition of the fire, its rate of spread, and difficulty of control. The intensity of the burn and the size of the fire is determined by the objectives the fire is expected to meet, and following each fire there is a thorough mop-up to make sure it doesn't re-ignite.

In situations where the smoke from a prescribed fire may present a problem, care is taken to try to control the amount of smoke by choosing exactly the right weather conditions for the fire.

Don't Forget Wildfire

British Columbia's fire prevention message still holds. More than ever, the public is encouraged to do all it can to prevent and report wildfires.

The only kind of fire that land managers are encouraging is prescribed fire. That's carefully controlled fire, fire that serves the resource-use needs of society. And it certainly isn't for amateurs.

No part of B.C. has escaped the impact of the world's sagging forest economy. In northwestern B.C., Terrace, a victim of both its setting and history, is facing an uncertain future. Smithers, whose young forest industry is part of a broadly-based economy, is definitely struggling. But in both towns, and in all the villages in between, the people are determined to weather. . . .

HARD TIMES IN THE NORTHWEST

by *Peter Grant*

Clouds and mountains hang over Terrace on an early spring afternoon, sleet washes the Prince Rupert highway. The nearby railway tracks carry the weight of history as well as freight.

In the first years of the century these tracks, under the name of the Grand Trunk Pacific Railway, wound down from the Coast Mountains. They linked the northwest with eastern points, rang the death knell for a colourful steamboat commerce plying the Skeena as far upstream as Hazelton, and gave birth to the town of Terrace. Today the railway is called the Canadian National, and the area's 25,000 people spread far into valleyland radiating in four directions. Several suburbs, begun before the railway arrived, maintain their independence from the city.

The first loggers in the area stacked cordwood near the Kitsumgallum and Old Remo steamboat landings. The boats' boilers needed lots of fuel for the slow trip upriver. When the railroad came, stump ranchers cut wood for ties. Later, the interest was in old-growth Sitka spruce, shipped east to make small fighter planes. During the 1920s Terrace was the "pole capital of North America," as cedar trees stripped and cut to length rolled onto flatcars bound for exotic places like New York City.

Terrace has continued to grow in bursts of industrial development. Today many residents work in the Alcan aluminum plant or the Eurocan pulp mill-sawmill complex in Kitimat, only a 40 minute drive away. With government services, heavy machinery servicing and other industries, Terrace is now a trade, service and transportation hub for a large area that includes the upper Skeena and remote Nass River headwaters.

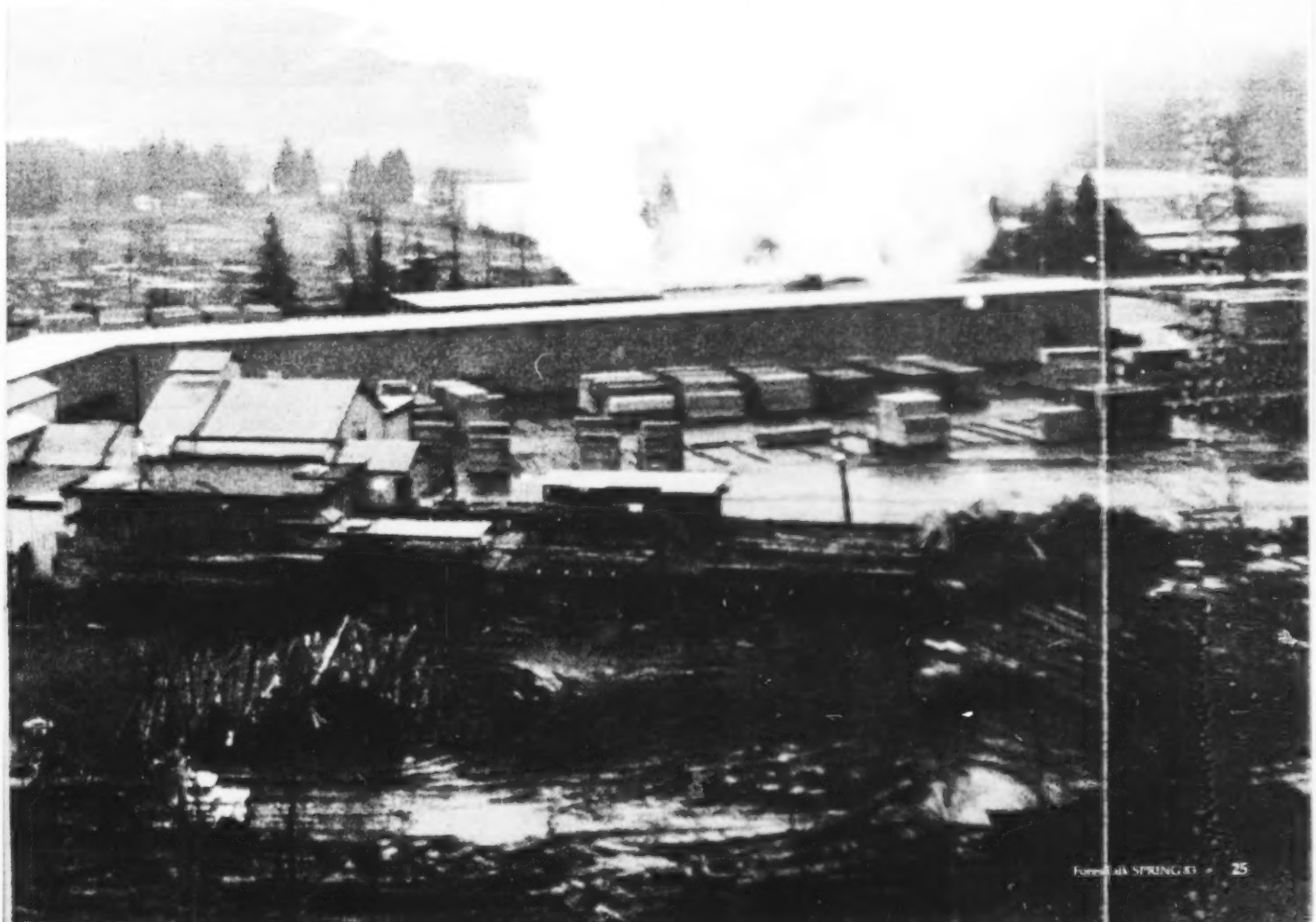
Even with this broad economic base, however, Terrace's main employer is still its mills. When they're doing well (and they've enjoyed prolonged booms in the past 30 years), Terrace rides high. But when the forest industry hits hard times, Terrace hurts.

For almost two years now both the Skeena valley's lumber and pulp industry have suffered from the worldwide slump in demand for these products. By last fall, over 35 percent of Terrace's workforce was unemployed, with over of 200 people a month going on income assistance as their unemployment insurance benefits ran out.

In September, a soup kitchen feeding as many as 100 people a day was started by an unemployed people's committee. Comments Paul Johnston, a construction worker involved with the committee: "It's sad. Increases in marriage break-ups, domestic violence and crime are attributable to the economic downturn."

In mid-October, B.C. Timber Ltd. shut down all its northwestern logging operations until markets could improve. A month later the company was forced to shut down its Prince Rupert pulp facility. This in turn led to the closure of two more sawmills in Terrace and one in Hazelton that supplied wood fibre for the pulp mill.

Behind the current picture of depressed lumber and pulp markets is a change that has taken place in the local forest industry itself.



In recent years Terrace's mills and logging operators have been drawn into the orbit of B.C. Timber's large pulp manufacturing concern near Prince Rupert. In addition to Terrace, other centres on the Skeena, like Kitwanga and the three Hazeltons, are now in the pulp chip business, running logs unfit for lumber through special chippers and shipping the chips to Prince Rupert on the railway. Sawmill operators have stayed in business because they sell chips as well.

Why this difficulty in making ends meet — even at the best of times? As an economic study of the northwest pointed out about its pulp mills ten years ago, the forest economy is boxed in by the high costs of trying to make a profit from poorer-quality forests growing on hard-to-get-at terrain.

The repeated cycle of good and bad times has been hard on businessmen too. Most of the sawmills on the Skeena have passed out of local hands and now belong to B.C. Timber. In coping with a two-year slowdown that has thrown more than 2500 workers in the forest industry out of work, people in Terrace are feeling what it's like to be part of a large pulp manufacturing enterprise.

Just what kind of economic development would the people of Terrace ideally prefer? A survey conducted by the Terrace-Kitimat labour council (when plans to build a local steel mill were under discussion) showed that a majority of the area's residents favour slow growth over big projects. They want to preserve the quality of life the local environment offers. No wonder: according to a study by UBC sociologist Patricia Marchak, both Terrace and Hazelton have a larger proportion of long-time residents than do most other comparable northern towns relying on resource-based industries. People who have moved there have stayed, as have many of their children after them. The result is an unusually stable population — "it," Marchak comments, "there's a viable industry."

One Terrace native who has fought unsuccessfully for slower overall development is George Kotoed. After working as a logger for 25 years, Kotoed is now a federal fisheries warden. "We should be hollering and screaming for more secondary industry," he maintains. Kotoed's home, a short distance from town, is ringed by a

50-year-old forest. "We still have the illusion of living in semi-wilderness."

Given that Terrace has always been dependent on its forests, it would seem logical that everyone in town would want to be in on how forestry decisions are made. But, like the forest economy itself, public involvement in forestry is cyclical. Today it is on the rise again. Members of the Skeena Protection Coalition, an environmental group, sit on a newly-formed Terrace public advisory committee in Terrace along with representatives from the forest industry, the IWA, and others with a stake in forest management.

Reforestation is of more than idle interest to people involved in the future of the forest industry. Even in the near future, shortages of quality timber loom. Until young growth matures in the valley bottoms, the local mills will have to get their wood from distant sources. While there are large reserves of timber to the north, much of it is low-quality, overmature hemlock and balsam, good only for pulping — and then only when low-cost transportation makes it economic to harvest the wood at all.

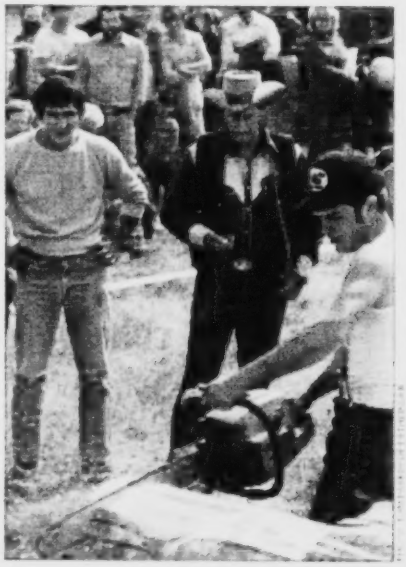
With this problem-strewn landscape in view, B.C. Timber is reorganizing its northern operation. "We're recognizing these forests for what they are — a pulp log resource," explains Rod Arnold, B.C. Timber's northern division forestry manager. "It's only about 40 percent sawlog material." This shift in thinking will have an affect on Terrace's economy — perhaps a big one. At the top of B.C. Timber's fix-it list is more efficient handling of wood between the forest and the pulp mills, with more chipping of pulplogs before the wood is shipped to the Prince Rupert mills. One of Terrace's largest sawmills will even become a huge chipping plant. Later, new plants may be built closer to the forests and away from the town. Observes mayor Helmut Giesbrecht: "Some see this as the end of the forest industry's domination of the economy of Terrace."

To some people, the difficulties facing Terrace are the result of forces beyond local control: world economics, regional geography, and so on. To others, it's been more a case of "economic suicide," to use northwest resource consultant Bill Horswill's frank condemnation of past resource use.

But whatever the causes of today's tough economic climate, the people of Terrace have every intention of riding out the storm.

Not far upstream from Terrace, the Skeena River valley narrows almost to a canyon. There's less of a gorge here than with another river that slices through the Coast Mountains, the Fraser, but the mountains on either side of the Skeena are just as impressive. Nestled here and there on the landscape are some holdouts against the changing trends in the forest economy.

In Kitwanga, where brothers Richard, Clifford and Elmsley Morgan operate Kitwanga Native Development Incorporated (KNDI), the idea is to establish a self-sufficient forestry operation. "We want to keep the economy going in the area," says Clifford Morgan. The local band already provides the bulk of the B.C. Timber sawmill's labour force, having negotiated for a training program, updated facilities and even the mill's continued operation. Having failed in its application for a local tree farm licence, KNDI simply wants B.C. Timber to keep the mill running. "We'd rather work with the big company than fight them," says Clifford. "They're part of the same community."

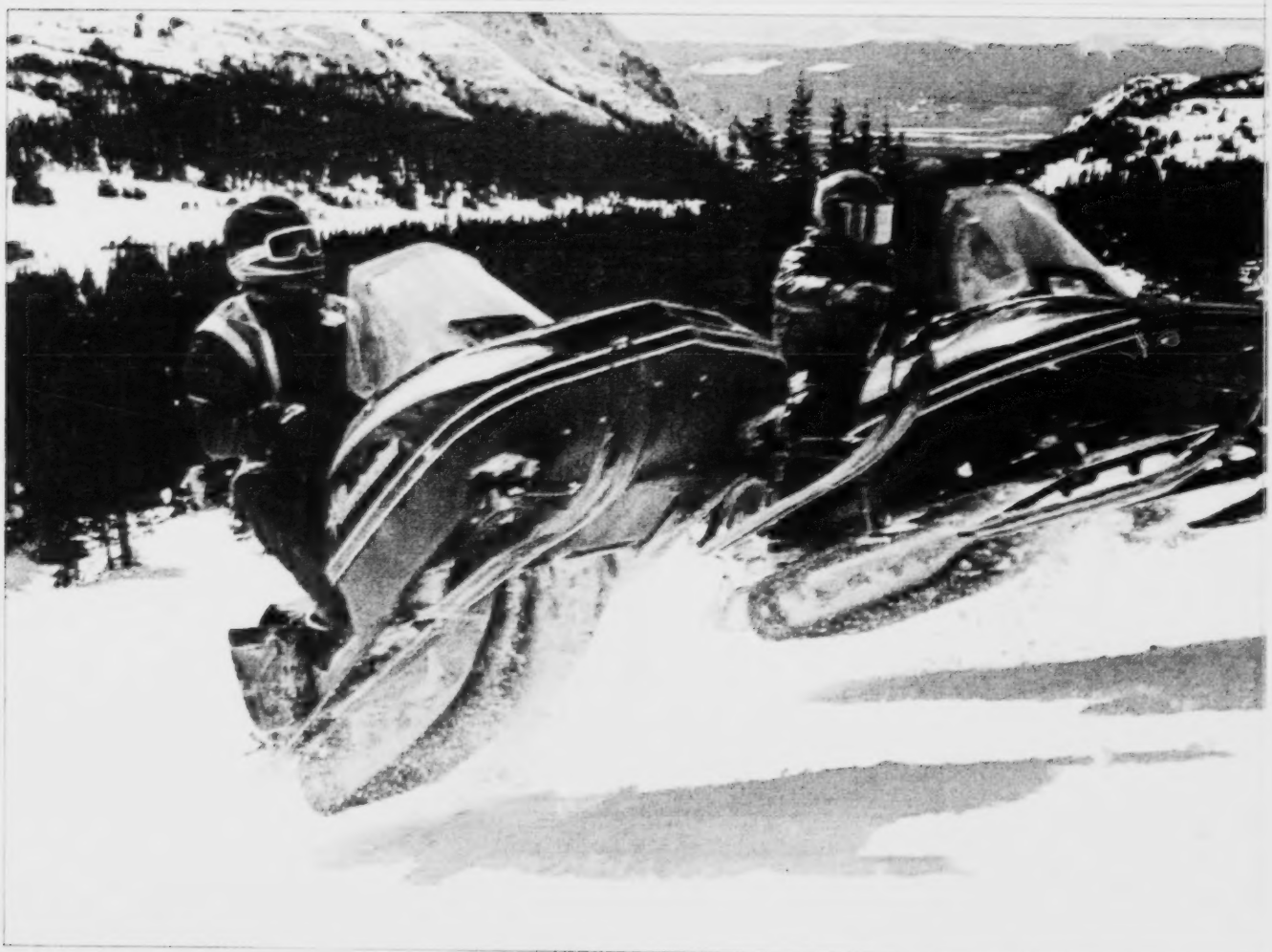


(Above) ***Logging is a way of life in the northwest, and loggers' competitions are a popular part of the Bulkley Valley fall fair.*** *(Bottom, left)* ***Members of Kitwanga Native Development Incorporated are trying to keep the local economy alive with their logging operations, but it's a hard struggle. B.C. Timber's Skeena sawmill in Terrace*** *(previous page)* ***will stay closed until the company's Prince Rupert pulp mill*** *(top left),* ***which gets wood chips from the Terrace mill, can re-open.***

Further on is a cluster of villages bearing the same Hazelton name, but they have stubbornly retained their separate identities. Near South Hazelton is Irwin Stege's small sawmill, which he has kept running steadily through the recession. Stege digs up sales for specialty lumber products from as far away as Ireland and Saudi Arabia. He gets much of his wood from local timber sales.

"Sometimes I have 30 different cuts of timber in my yard," Stege says, while exercising his prize Trakehner stallion in a field adjoining the lumber yard. Stege wants to modernize his mill by adding a small log line and a chipper and by eliminating the sea of mud the loaders in the yard have to wade through every fall and spring. The trouble is, he has to borrow the money for these improvements and, he says, "The first question a banker asks is: 'What's your timber supply?'"

Stege is in luck. One of the few independent mill owners left in the Skeena Valley, he was recently awarded a timber allotment by the Ministry of Forests.



It's only a short drive up the Bulkley River to Smithers from Hazelton, but Smithers seems like another world. For one, the valley opens out into spacious, flat farmland. In town there's a touch of Switzerland about the buildings, a reminder of the Swiss farmers who moved to the Bulkley Valley en masse early in the century. Although Smithers hasn't completely escaped the effects of the current economic downturn, there's been no need for soup kitchens here. "We've been more protected from the recession than other communities," notes Bulkley forest district manager John Wenger. Much of the credit for this, he adds, must go to the local forest industry.

"We're a company like any other," says sawmill owner Dick Groot. Well, not quite. Groot's mill, and Pacific Inland Resources (PIR), which are Smither's two main forest operations, have kept running while other towns suffer 30 to 40 percent unemployment.

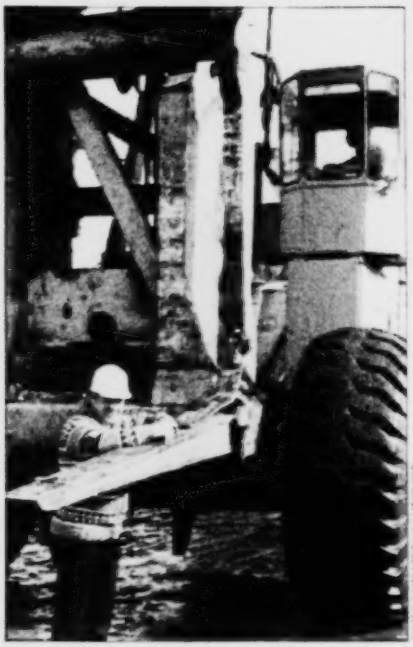
How do they do it? Partly it's a matter of good fortune. Don Burton, Groot's woods manager, points out that local lumber is always in demand because of its superior strength and quality. (The forests of the Bulkley Valley are interior rather than coastal types — mostly balsam, pine and spruce. They grow slowly, so they produce tightly-grained lumber.) Geography is also on the side of the Smithers' forest industry; roadbuilding has been relatively easy, so development costs have stayed low. And good marketing has a lot to do with the industry's stability. Groot has cultivated a growing market for lumber in Alaska, and in a Richmond, B.C. box factory.

Smithers is the opposite of a boom town, having grown slowly into a community of 5000 with a healthy mix of industries — beef and dairy cattle farming, mineral prospecting, big-game hunting, the railway, and government services.

The forest industry may be the biggest single employer, but it accounts for less than one-fifth of the town's wealth. By staying relatively small the forest industry has banked a 'savings account' of the limited timber available in the valley. The timber harvest has grown only modestly in recent years, and company expansions have been based more on good wood utilization, like the particleboard plant Groot recently built to make use of planer shavings.

Bulkley Valley's residents have to be forgiven if they seem a little smug about the good life most of them still enjoy — including one of the best downhill ski slopes in the province on nearby Hudson Bay Mountain. But they are also quick to spot any threats looming on the horizon. A number of forest-watchers have served since 1976 as watch dogs on the Smithers public advisory committee (the first such committee organized by

(Below) ***Irwin Stege of South Hazelton, whose small sawmill produces speciality lumber products for an international market, takes a moment to exercise his prize Trakehner stallion.*** *(Bottom)* ***By keeping his Smithers sawmill operating, Dick Groot has made a major contribution to the town's economic stability.*** *(Opposite page)* ***Good forest management means managing for various uses, a fact appreciated by snowmobilers enjoying the trails on the Babine Integrated Management Unit near Smithers.***



the Ministry of Forests). They've consistently pressed for a go-slow approach to harvesting the region's limited wood supply.

Comments Richard Overstall, who lives in nearby Telkwa and works for the Gitskan Tribal Council: "If the ministry over-estimates the allowable annual cut, the industry will log the old growth too fast, and the eventual result will be a talldown — an overall reduction in the timber supply. In 10, 20 or 40 years, when the crunch comes, the loggers will start looking around at areas set aside for wildlife or aesthetics and say: 'Either we log those areas or lay off 100 people at the mill.' The whole idea of planning is to avoid these situations."

Making sure all available forestland is harvested as efficiently as possible is, of course, a key concern of forest manager Wenger. Admitting that in the past "we have been overcutting in our spruce and pine timber types at the expense of the lower-quality balsam types," he has taken steps to tackle the problem. Last winter his staff conducted volume and decay studies in low quality stands to determine how much timber was suitable for sawlogs and how much for pulpwood. Wenger wants the companies to get over 40 percent of their sawlog timber from these balsam stands. Moreover, a sale of pulpwood from forests that were never considered part of the valley's timber supply is in the offing. "This is the kind of proposal we only dreamed of a few years back," enthuses Wenger.

"Under normal circumstances we would be cutting balsam stands already," Dick Groot says, but a freak of weather and a beetle invasion have shelved normal logging plans in the valley. Just as the loggers finished salvaging three years' worth of logs from a huge blowdown in 1978, an outbreak of mountain pine beetles has forced them into another clean-up operation.

These salvage operations were planned by a committee with representatives from the Ministry of Forests and the companies involved. The same cooperative spirit is well-established in a standing committee planning forest management for the valley. "In other parts of B.C.," says John Wenger, "these committees are just starting."

And it's precisely this kind of community spirit that will carry the people of the northwest through today's hard times. ◘

People

Kaj Nielsen

by Don Bailey

He calls it "becoming a part of the ecology." And for 55 years Kaj has used his talent for "seeing" nature to literally carve out a special niche in B.C.'s wilderness.

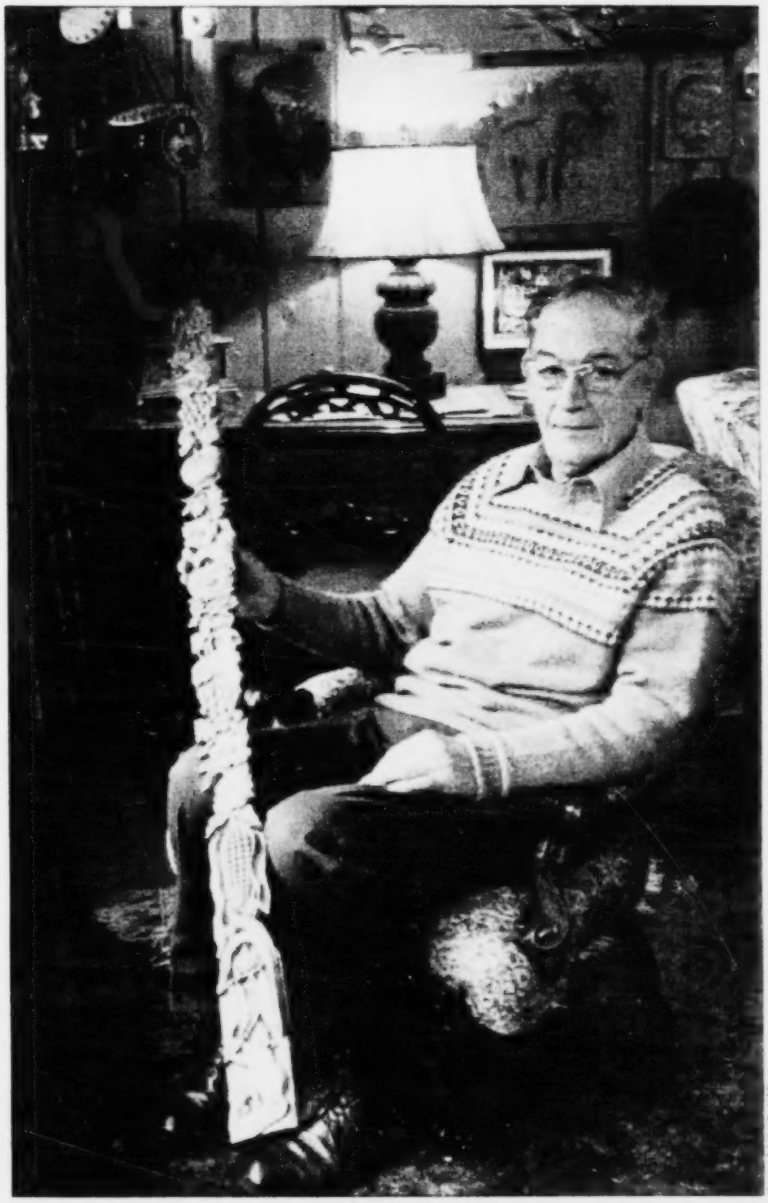
As Kaj Nielsen applies his carving tools to the thick block of oak a faint smile crosses his face. He scrolls a final cut through the wood and holds the finished product up to the light. The perfect replica of a newborn fawn fits into his wide, calloused palm. "The deer is grace itself," he says. "Even when he is frozen in stillness his big ears are constantly flicking, working the air for any disturbance."

"Most people do not *see*," he insists. "They just look." And because Kaj (pronounced "Ki") sees so clearly, he has been able to produce hundreds of animal carvings in perfect detail. The wolves, bears, eagles, and moose are all frozen in dramatic action, depicting the special character of each.

Kaj believes that the greatest dramas of life occur in the wilds. "Canadians live right next to nature yet so few of them really know it," he says. "There is only one way to discover the true wilderness. And that is to become part of the ecology. After you've wandered into the bush, snapping tree branches and scaring away the animals; then you must *sit and be still*."

In this way Kaj once observed a stunning display of wildlife drama in Victoria's Goldstream Provincial Park, which is next door to his own property. "I was sitting quietly in a small depression when I noticed a group of seven deer on a ridge. Something scared them and they came flying down the hillside through the trees and broken rock. They came straight toward me and I lay flat on my back. Then one by one they jumped the depression, and I was staring into the whites of their bellies. I could see every muscle struggling, the bounding of their legs, their tails bobbing. But to discover that I had to *be still* and *see*."

Not all of his encounters with the wild have ended so happily. During the Depression years Kaj went looking for work in Trail. One night as



he wandered through the bush he heard a terrible high-pitched scream. "I knew immediately what it was," he says. Fortunately he had his rifle at hand and lay down on a hill. Eventually his patience was rewarded: ahead a snaggle-toothed cougar was stalking his trail. He waited until the animal was within range and shot it.

"I never waste an animal if I can help it," Kaj says as he displays the skull of the malevolent cougar, "but this one was dangerous." He points out the broken and decayed teeth, a sure sign that the big cat was in his last year. "After he was dead I put the head on an anthill. Within three days it was cleaned to the bone, just as you see it now."

Though he's an expert Canadian woodsman, Kaj began life in Denmark in 1909. During his childhood he started doing his first carvings. Initially he made paper models and gradually developed his talents using pen-knives to whittle small animal figures. At the age of fourteen he joined the Danish Merchant Marine. For the next two years he sailed around the world, immigrating to Canada in 1927. After a year of compulsory labour on Manitoba farmland where he earned five dollars a month (immigrants were required by law to spend their first year working on a farm), he began to explore his adopted country. He survived a seven-day period of near-starvation in Winnipeg, then landed a job "175 miles from nowhere. It was in the wilderness way north of Lake-of-the-Woods."

The long hours passed in remote logging camps provided the opportunity he needed to fully develop his carving skills. During the Depression he travelled throughout the Canadian wilderness from camps in Ontario to the Queen Charlotte Islands. Each new area offered something unique to his observant eye and his carvings became more elaborate and detailed.

"It is the richest heritage in the world. *In the world*," he repeats emphatically. "This country has something to offer all of mankind. Yet the average Canadian knows so little about his own history."

Kaj has taken the effort to discover Canadian history from its beginnings and to capture some of its more dramatic episodes in mural carvings: Champlain brooding on the deck of his ship, a French frigate launching a broadside cannonade against the English, Captain James Cook landing at Nootka Sound. Everything is carefully researched from historical drawings and from the works of C.W. Jefferys's *Picture Gallery of Canadian History*, to insure that details are rendered as precisely as possible.

After his discharge from the army at the end of World War II, Kaj opened a studio in Vancouver doing commissioned carvings for architects and other professionals. Word of his work reached the parks division of the B.C. Forest Service, and in 1950 he was hired to carve the gate posts and entrance signs that adorn many of our provincial parks. (The management of B.C.'s parks remained with the Forest Service until 1957). Once he carved a

six-by-eight foot topographical replica of Manning Park. The final product was a perfect reproduction: when water was poured onto the wooden mountains the run-off exactly matched the river routes of the park.

After this success Kaj's carving knives were turned to other projects: the Premier's speaking podium in the Victoria parliament; the entrance signs at the University of Victoria, Mile '0' at the start of the Trans-Canada Highway in Victoria; all the signs in Victoria's Beacon Hill Park. Most of these works are graced with a dogwood blossom, Kaj's favourite flower. He sees to it that the dogwood appears on most of his public signposts.

In 1952 he left the Parks Division to dedicate his time to more artistic carvings. The same year he won the gold medal for carving at the Pacific National Exhibition. But rather than continuing to compete in his art, Kaj has withdrawn from public exhibitions. "Once you've taken the gold medal," he explains, "you should let other people have a try at it."

While most of his prize-winning pieces are miniatures of B.C. flora and fauna, he once carved a two-ton, 17-foot high statue of "Twelve-Foot Davis." Davis was a pathfinder and prospector who discovered a 12-foot strip of gold in the Peace River district. To add to the Davis legend, Kaj created his larger-than-life statue and carted it into the north country where it still stands.

Curing his woods is a time-consuming task for Kaj. "This is a green country, and like the country the wood is green." Before he moves any wood into his basement workshop it is dried outdoors in a covered storage shed. "It is never kiln dried. You cure it naturally: one year for every inch of thickness." You match the wood to the job. Pine is a favourite of mine. Oak is a lovely wood. Any carver loves oak." When a carving is complete, oils are used to treat the woodgrains. As far as Kaj is concerned, "woodstain is mud. It lies on top of the wood like a dirty blanket."

The best wood is saved for his favourite projects. His study of 17th century carver Grinling Gibbons has inspired Kaj to reproduce antique European furniture. The tables, chairs, desks and cabinets that fill his home are masterpieces of history. Each piece is cut in loving detail, without shortcuts or modernization.

Yet in spite of the perfect furniture, the public works, the historical murals, you sense that Kaj Nielsen's greatest love falls to his animal carvings. And of those, which are his most prized?

"The horse has always been my favourite because it has a sense I wish all humans had," he says. "And that is common sense." His years of experience breaking stallions on the prairies and leading teams through the forest near Revelstoke created his profound respect for horses, especially for their durability.

Asked about his own durability, Kaj smiles broadly and winks. "I'm just beginning," he says. "A man doesn't know a thing until he's had 35 years of real consciousness. I'm 75 years old right now. Ask me again in 20 years."

LETTERS

2,4 D Revisited

The Ministry of Forests and the editorial board of *ForesTalk* has earned congratulations for courage in tackling the thorny problem of herbicides and the forest ("The Great Herbicide Debate" *ForesTalk* Fall/Winter 1982). I wish to further the debate to promote understanding of the real risks involved.

The forester is faced with the same problem as the farmer and home gardener. Weeds — unwanted plants — interfere with his plans to grow a specific crop efficiently and profitably. The home gardener is not governed by the laws of economics; he can elect to pull weeds all summer, or use a chemical, or both. The answer is less clearcut for the forester and farmer; physical weeding is practicable and economical in some instances, but generally not.

The evidence against herbicide use is primarily emotional and tends to focus on what might happen more than on what has happened. The herbicide 2,4-D is not particularly toxic — about equal to caffeine — but it is invariably referred to as a poison or toxic substance by opponents. The media in particular seem to emphasize this in reports or quotations.

Secondly, there is the play on fear. Man has an innate fear of poisons — possibly an inbred fear that goes back countless generations. What seems to be lacking all too often is a sense of perspective, or balance. T.C.D.D. may be the most poisonous substance known to man but I have yet to read where a human being has been shown to be poisoned by it — yet I doubt if any reader of *ForesTalk* has not been exposed. The same applies in scale to chlorine, arsenic, flourine and other common, natural and useful poisons to which we are exposed daily.

The fear of chemicals is magnified many times by suggesting that a substance may cause cancers, birth deformities or abortions. Scientists are slowly unravelling the secrets of cancer, etc., but in the meantime, those opposed to pesticides are instilling fear by magnifying risk. Karnofski's law, for example, states:

"Any drug administered
at the proper dosage
at the proper stage of development
to the embryo of the proper species
will be effective in causing disturbances
in embryonic development"

Examples of the truth of this law in the case of mice are that a diet of raisins for one day was associated with birth defects, as were airplane rides, loud noises, water deprivation and daily doses of 2,4-D.

More recently, research has identified stress as a critical trigger for many human problems including cancer. This seems to fit in with Karnofski's law.

To conclude, I would agree that the ideal world would be risk-free. It is not an ideal world and risks abound every day in our lives; what we must do is attempt to reduce risk without being totally unrealistic. Little is gained by banning use of useful chemicals which *may* cause cancer, abortions, and birth defects at levels of risk which would appear to be so small they are still undefined. Sir Edwin Pochin has calculated that I am exposed to 1:1,000,000 risks of death for each:

400 miles of air travel
60 miles of car travel
¼ of a cigarette
1½ weeks of factory labour
20 minutes of life as a 60-year-old

If my risk of harm from pesticide exposure is 1:1,000,000, is this unacceptable?

I endorse a continued program of careful and controlled use of herbicides subject to the rules laid down by our protection agencies and a continuing re-evaluation of risks and benefits based on expanding knowledge. Certainly, based on lack of hard evidence, the risks seem infinitesimally small.

D.L. Handley
Manager, Designed Forest
MacMillan Bloedel
Nanaimo, B.C.

In all the controversy about using or not using pesticides, one very significant report receives surprisingly little notice. In 1980 the U.K.'s Advisory Committee on Pesticides, which is chaired by the Dean of Medicine at Leicester University, submitted a "Further Review of the Safety in Use in the U.K. of the Herbicide 2,4,5-T." The first paragraph of the Committee's conclusions, quoted verbatim in *Commonw. For. Rev. 60(2)* 1981, states:

"What we have had to consider in this Review is whether there is any sound medical or scientific evidence that humans or other living creatures, or our environment, would come to any harm if cleared 2,4,5-T herbicides continue to be used in this country for the recommended purposes and in the recommended way. We have found none.

We have cast far and wide in the search for such evidence . . . ".

That is a pretty blunt statement and it is only rarely that a group of scientists will be so emphatic. Given the credentials of the Committee members it is a clear statement which must be accepted.

Roy M. Strang
Executive Director
Forest Research Council
Richmond, B.C.

I recently received a copy of the Fall/Winter 1982 issue of *ForesTalk* to review the article, "The Great Herbicide Debate." I was highly impressed with the article and commend the authors. In addition, as a displaced B.C. Neighbour (Montana), many of your other articles and commentary were near and dear to me. Your publication is indeed worthy of its award-winning status.

Dennis R. Hamel
Pesticide Specialist
U.S. Forest Service
Washington, D.C.

This Ranch Is O.K.

With reference to the article "Chilcotin Roundup" by Douglas Cowell in the 1982 Fall/Winter issue, a correction is in order. The photograph on page seven is not in the Chilcotin area. It is actually part of the very much alive O.K. Ranch on the east side of the Fraser River above Jesmond, B.C. The O.K. headquarters are further along the road. It is true a large portion of the Chilcotin Plateau is less than ideal range for domestic livestock. However, it is also true the grassland benches straddling the Fraser, Chilcotin, Chilco and Taseko Rivers and the vast organic wetland meadow systems provide quality forage comparable to any other range area. Otherwise, the article is quite entertaining and down to earth.

Don Blumenauer
Ministry of Forests
Williams Lake, B.C.

Just a slight correction to your article "Chilcotin Roundup" in the Fall/Winter 1982 issue.

The picture on page seven captioned "an abandoned homestead" in the Chilcotin is in fact in the Jesmond area west of Clinton and east of the Fraser River. The buildings are part of the O.K. Cattle Company — recently sold to C and A Mink Ranch. This ranch has been and is a very active, viable operation.

Robin Fennel
Ministry of Forests
Clinton, B.C.

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NETTLES & OTHER POTHERBS

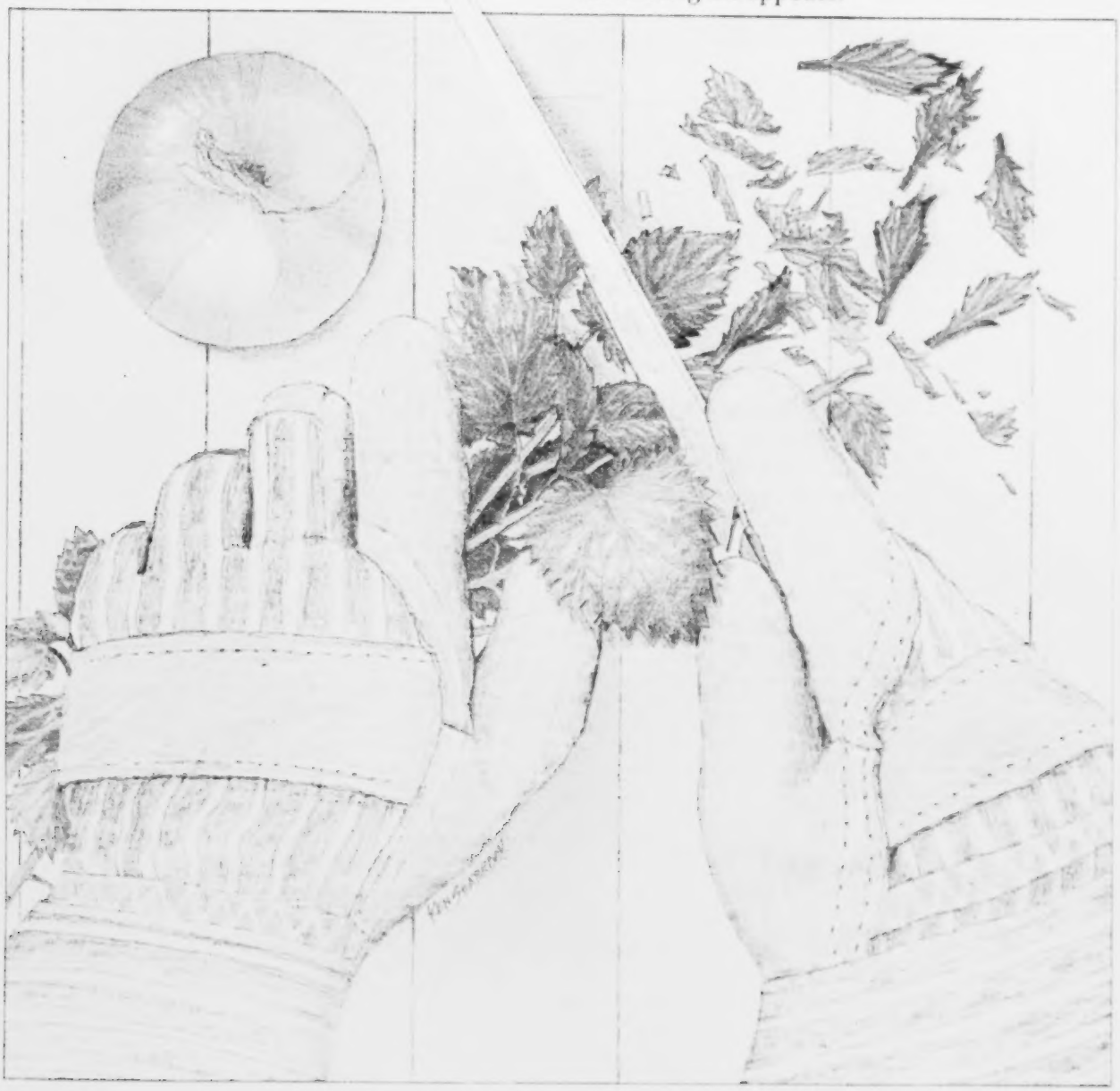
FOREST HABITAT

by Enid K. Lemon

While the rare or beautiful plant may give us pleasure, the common weed often proves to be of greater practical value. Such is the case of the stinging nettle *(Urtica dioica)*.

When the nettle's luscious green leaves first appear at the edge of the woods, or in damp places where the soil is rich, you know that spring is coming. When you cook and eat some of those leaves, you know that spring has arrived.

This often unwanted weed is rich in calcium, potassium, iron and vitamins A and C. Modern herbalists recommend nettles for a general tonic, for asthma, bronchitis and for stimulating the appetite.



The edible part of nettles are the tender shoots that spring up from perennial rhizomes, or roostock. And be sure to pick the shoots early in the season. Later on, the leaves on the shoots are not palatable because of gritty particles called cystoliths that collect in them.

A word of warning: wear thick gloves and use a knife or scissors to gather the crop. It's no accident that the genus name of the plant is derived from the Latin *uro* — to burn. Both the leaves and stem are covered in bristly hairs which, when touched, inject formic acid into the skin and cause a stinging or burning sensation.

In Nordic folklore nettles were sacred to Thor, the god of thunder, and it was believed that you could protect your house from lightening by throwing nettles on a fire during a storm. Urtication, stinging the flesh with nettles, was an old herbalists' remedy for rheumatism.

Anglo-Saxons believed that there were nine sources for illness, known as flying venoms, one of which was green and could be cured by nettles. To dispel fever, roots were pulled up from a nettle patch while the names of the sick person and his parents were repeated out loud. Culpepper, the 17th century herbalist, sang the weed's praises:

"The tops eaten in the spring, consume the flegmatic superfluities in the body of man, that the coldness and moistness of winter have left behind."

Nettle fibre cloth was woven in Scotland until the 18th century, and dyes are still made from the plant. during World War II large quantities of dried nettles were processed to make green dye for camouflage purposes. The Indians of the Pacific Coast made fishnets of a very tough twine fashioned from the inner 'bark' of the nettle stems.

Not only is the nettle a very useful addition to our diet, but it is also food for a number of butterfly larvae, including the beautiful red admiral (*Vanessa atalanta*). Those who know the nettle only by its sting may now look upon it with at least grudging respect.

Lamb's quarters (*Chenopodium album*) was once the most valued vegetable in Europe before it lost favour to a near relative, spinach, introduced from Asia in the 16th century. In the opinion of many, lamb's quarters is tastier than spinach, certainly its leaves contain more iron than does spinach and they are high in calcium as well.

Remains of this plant have been found in Neolithic settlements all over Europe. A gruel made of the seeds formed part of the last meal of the Tollund man who died 2000 years ago. (His perfectly preserved corpse was found in a bog in Denmark in 1950.)

Strawberry spinach (*Chenopodium capitatum*), also known as Indian paint, is a close relative of lamb's quarters and can be cooked in the same way. This plant is a very useful vegetable for campers and hikers because it is often found in remote areas and can be eaten either cooked or raw.

In late summer the plant produces a mass of soft, strawberry-red fruit which the Thompson and Carrier Indians used to crush for colouring both clothes and basket material. Although the fruit is nutritious, it isn't very flavourful.

Fireweed (*Epilobium angustifolium*) is also known as willowherb because its leaves closely resemble some narrow leaved willows. Fireweed gets its more common name from its persistent habit of colonizing burnt-over areas almost before the smoke from the fire has died down, covering the landscape with a beautiful magenta colour.

Perhaps the tastiest portion of the plant is its young shoots; the

tenderist and juiciest shoots come from plants growing in moist and shady places. April and May are the best months for gathering shoots growing at low elevations, but since fireweed also grows at subalpine elevations where the seasons are slower to change, the plant can be gathered throughout the summer.

On Quebec's Gaspe Peninsula the local French Canadians still call fireweed "asperge" — asparagus. The early French Canadian voyageurs frequently used fireweed as a potherb and called it "herbe frette" — cargo herb. This was no doubt because of its great abundance and ease of cooking.

Owing to its very long flowering season, fireweed is an important plant to the apiarist, who may transport his hives many miles throughout the summer to take full advantage of the flowers.

Today, with more and more people using the outdoors for recreation, the gathering of wild plants is more popular than ever. But never pick any plants growing by the roadside. They are likely to be contaminated with either car exhaust or weedkillers. Be sure you have your plant correctly identified, and eat sparingly until you are certain your new-found delicacy does not cause an allergic reaction.

KITCHEN HINTS FOR FOREST EDIBLES

Nettle Basics

Nettles shrink in cooking, so pick more than you expect to eat. Wash them well, then put them in a pan without any extra water. Add salt, pepper and a knob of butter. Cook over a gentle heat, drain, but keep the juice to make a tasty soup which, if seasoned with salt, pepper and a very little vinegar, is supposed to be efficacious in removing unwanted pounds. This same juice, cooled, is said to be a fine hair tonic.

Nettles a la Pepys

An old English recipe mentioned in Samuel Pepys' famous diary: Start with 2 cups cooked and chopped nettle leaves. Add 1 cup chopped leek or onion, 1 cup of chopped cabbage, 1 cup raw rice, 1 cup ground beef and ½ cup fine chopped beef suet, 1 teaspoon salt and a little ground pepper. Mix well, then tie the mixture in muslin or cheesecloth that has been wrung out in cold water. Drop into boiling water and boil for one hour. When you remove the cloth you have a round ball of pudding. Serve with a rich gravy — delicious.

Nettle Tea and Beer

Nettle tea is made by adding one pint of water to one ounce of fresh, washed nettle tops. Boil for three minutes, infuse for 10 minutes, strain and serve without milk or sugar.

Nettle beer is still made in some parts of England. Use one pound of nettle tops, the juice and rind of one lemon, ½ gallon of water, ½ oz. cream of tartar, ½ pound dark brown sugar, ½ oz. brewing yeast, and a small piece of root ginger. Wash the nettles and put them in a large saucepan with the cold water, lemon rind and bruised ginger root. Cover and bring to a boil, then simmer for 15 minutes, stirring occasionally. Put the cream of tartar, sugar and lemon juice into a large bowl and strain the nettle water into the bowl, stirring well until the sugar has dissolved. Cover and cool to blood heat. Add the yeast according to manufacturer's instructions. Cover and leave for three days in a warm, draught-free place. Skim and bottle in sterilized bottles; if it is fermenting, screw the caps on and then release half a turn. After a week serve the beer cold.

Sweet and Sour Lamb's Quarters

Wash 1½ pounds of lamb's quarters leaves and shred finely. Fry 4 strips of bacon until crisp. Remove the bacon and saute the lamb's quarters in the fat for 8 to 10 minutes. Add one finely chopped onion and continue cooking until onion is lightly browned. Add one tart apple, diced, and pour in 2 cups of boiling water. Let the mixture simmer until the apple is tender. Sprinkle with 2 tablespoons flour, 4 tablespoons brown sugar, 2 tablespoons vinegar, and let simmer for 5 to 10 minutes. Crumble bacon over top of mixture and serve at once.

Fireweed In A Pan

After washing the young fireweed shoots, cut them into small pieces, barely cover with water, and cook for 3 to 5 minutes until tender. Serve with butter. Alternatively, cover them with a curried sauce. As with many wild greens, fireweed is a slight laxative. Eat only a small portion at first. Young fireweed leaves pan-steamed with butter for about two minutes make a savoury dish.

BC

Ministry of Forests
Honourable Tom Waterland, Minister

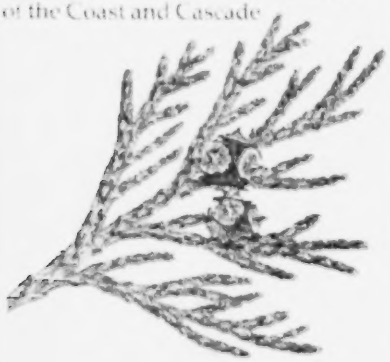
YELLOW CEDAR

(Chamaecyparis nootkatensis)

Just as Douglas fir is not a true fir, yellow cedar is not a true cedar. It is a cypress, and a false cypress at that.

With its scaly foliage the cypress closely resembles the western red cedar, but its leaves are prickly to the touch when stroked against the grain. Its most notable characteristic is its distinctive aroma. Both red and yellow cedar have stringy bark; in old age both develop swollen butts and fluted trunks.

Yellow cedar can grow as tall as 50 metres (150 feet), and often reaches at least 40 metres. On coastal islands and on the west side of the Coast and Cascade



mountains it is found scattered or in small stands mostly between 700 and 1000 metres (2000 to 3000 feet). In the south it is more likely to occur at much higher locations. Overall it can be found within a broad range of elevations and is fairly common on some sites. It even shows up occasionally in the B.C. interior.

Yellow cedar produces a wood that is harder and heavier than red cedar's, but still light and strong. Highly durable, close-grained, evenly textured, and of a beautiful yellow, the wood is valued for interior finishing and is a favourite of boatbuilders. Northwest Coast Indians made canoe paddles from the wood and carved ceremonial masks from the trunks.